The United States MILLER

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GRAIN.

Peculiarities in its Normal and Manufactured State.

An Investigation Under the Microscope—Showing the Adulterations and Natural Evils to which It has been Subjected.

A COMPLETE INVESTIGATION OF THE SUBJECT BY ONE OF THE LEADING CHEMISTS OF EUROPE.

Flour in General—Wheat Flour—Rye Flour—Barley Meal—Oat Meal—Indian Corn—Rice Meal.

[Translated from the German of Dr. Herman Klencke expressly for the UNITED STATES MILLER,—cuts reproduced by our special engraver from the original.]

[CONTINUED FROM APRIL NUMBER.]

Robine has proposed another method which is based upon the quality of acetic acid, when diluted with water to dissolve the gluten and albuminate substances which are to be found in flour, without producing a change in the starch meal. The greater or lesser specific weight which the solution of the gluten and albumen in the diluted acetic acid acquires is the criterion by which the gluten and then through this the quality of the flour can be judged of. The specific weight will be the greater the more of gluten and albumen are dissolved, consequently the better the flour is. For this purpose Robine has invented an areometer, which he has called "Appreciateur des farines," or flour-tester. The mode of its application is very simple and easy. The instrument is a scale, the graduated tube of which is so divided that each degree indicates the amount of gluten in good flour which would be necessary for a loaf of wheat-bread weighing 2 kg. For this purpose the diluted acetic acid is at first prepared by pouring so much acetic acid in distilled water, so that when it is put into a glass cylinder of suitable height and the meal-tester is let down into it, the latter sinks down to 98 deg. If the acidulous liquid is heated to 15 deg. C., the flour is stirred in for every 31.25 kcm. of this diluted acetic acid 4 g. of flour. We will make this proportion plainer by a description of the experiment itself.

If the flour is supposed to be very good, 24 g. (of poorer flour 32 g.) must be taken. Suppose now that we have taken 24 g. of good wheat flour which we wish to examine; we have then 6 times 4 g., and must accordingly take 6 x 31.25 kcm., consequently 187.5 of the acetic acid diluted as before prescribed. The flour is put into a mortar of porcelain and softly grated; the acid is added, and the mass is stirred for about 10 minutes, so that the gluten will dissolve; then the solution is poured into a glass that is placed in water heated to 15 deg. C. After the course of an hour, during which time it is left to settle, a sediment of starch and particles of bran has been formed; the milky liquid covering it is carefully poured off, and now the instrument is lowered into it. The degree to which it will sink shows the number of times 2 kg. of wheat bread which a certain amount (here 159 kg. are assumed) of good flour must yield. Usually the result deviates between 101—104 deg., or just as many loaves of bread of the assumed weight of 2 kg. If this liquid is saturated with the bicarbonate of natron, the acetic acid separates from the gluten; the latter appears floating on the surface, and it may be gathered on a linen cloth, washed out with cold water, and thus obtained pure. Wheat flour has also been discovered that betrayed small admixtures of metallic copper, even of lead, bismuth, etc., from the use of which painter's colic has resulted. Whether these metals have found their way into the flour in the grain warehouse, in mills, or on vessels during transportation, has not been definitely ascertained. If there is reason to fear the presence of an admixture of this kind, a portion of it may be burnt in a skillet of porcelain, brought in contact with nitric acid and then examined with reagents such as have been before mentioned in other cases. (Ammonia, for instance, will produce a white sediment from lead, and a bluish one from copper; potash produces similar coloring.) If the presence of any metal in flour is suspected, a test recommended by Duflos and Hirsch must be made. A portion of the flour is taken, stirred with distilled water to a thin mixture, and poured into a glass funnel which is closed below with a cork; then the dish wherein the mixture was made is rinsed with water, and the thin mass is again stirred in the funnel with a glass tube. At the end of about half an hour, by cautious lifting of the cork, a small portion of the sediment which has formed itself is allowed to run into a goblet which is half filled with good sulphurated hydrogen water. If the mixture turns gray, brown, or even black, it may be definitely concluded that the flour contains either lead or bismuth. This experiment may be further continued, especially to find out whether the metal is lead or bismuth, but it requires too much chemical skill to be of use to the public in general. When the presence of the metal has been ascertained by the above-named simple process, it will be sufficient to guard against the use of such flour. To ascertain whether wheat flour is good and unadulterated, Ure advised to take its specific weight as a criterion since the admixture of inferior kinds of starch which occurs but too frequently causes a difference in weight, as, for instance, a vessel which holds exactly ½ kg. of wheat flour will hold ¾ kg. when filled with potato starch. This test is certainly of value, when by the weighing of vessels of equal size filled with different kinds of starch and flour an empirical scale is found of the specific weight of each kind, if at the same time the more or less damp or dry condition of the flour is critically examined and taken into consideration. Ure also recommends to try a chemical experiment with flour. Nitric acid gives to pure, unadulterated wheat flour a fine orange color, which is not the case with starch and potato meal. Muriatic acid changes the color of pure wheat flour into a deep purple, but dissolves potato starch to a light-colored slimy liquid, which may be decomposed by alkali. Potato starch also absorbs less water than good flour, since it itself contains much water. We will try to make more accurate and true modes of experiments feasible for the public in general. The fraudulent adulteration of wheat flour for the purpose of gain is so manifold and frequent, that it is well worth the while to submit the matter to an exhaustive examination; and we may here, besides the experience of the French, English, and German, use our original or comparative experiments as a basis to our judgment. Flour is either adulterated to conceal the poorer quality or in times of high grain prices, seemingly similar substances of less value are added to the good flour, so as to obtain the quantity and weight by these less valuable admixtures, and it is just the great importance of flour as the most indispensable nutriment which even in times of high prices the poor must procure, whatever may be its cost, which not only renders this unfortunately so extensive adulteration of flour doubly culpable, but has also induced expert chemists and microscopists to detect the adulterations by certain processes and experiments. Although we have here in a more narrow sense chosen wheat flour as the object of our investigation, yet we must preface that the adulterations and examinations which follow may also apply to other kinds of flour, especially to rye flour; and in order to prevent repetition thereafter, we will refer to the means of examination and methods applied to wheat flour. Flour is adulterated by organic and inorganic substances. Let us first consider the former. A very common admixture of wheat flour is potato starch, especially since this substance changes neither the whiteness, the odor, nor taste of the flour. Yet wheat flour which has been mixed with it has the quality of absorbing by far less water than pure flour, and thus when of equal weight with the pure flour, will produce less bread than the latter. According to Boland's experiments, an admixture of but 25 per cent of potato starch renders the flour unfit for the preparation of bread, and it is not advisable to add more than from 8 to 10 per cent if it should be desirable to use it for the purpose of economy. Countless means and methods have been proposed to discover the presence of potato starch in wheat flour. To name a few only proposed by noted men, we mention suggestions of Chevallier and Henry, to scatter a pinch of the suspected flour on a piece of black paper, and examine either with the naked eye or with the microscope whether it shows bright spots. Chevallier and Bois de Loury recommend the blue coloring of the flour with iodine vapor, which will always have an immediate and strong effect upon the potato starch. Legrip has invented a peculiar instrument which he called the "similametes." Morin experimented by the different effects produced by sulphuric acid and muriatic acid upon pure and adulterated flour. Dupin and Dubec inferred from the differences in the color produced by nitric acid and nitrate of mercury, as well as from the difference in the specific weight. Blodriguez distilled dry flour and observed whether it would then react on acids or not. Cavalie examined and compared the different colorings which he produced on a quantity of flour by alcoholic tincture of iodine which contained acetic acid, after he had dissolved the flour in a definite quantity of cali and alcohol of 84 deg., etc.

Fig. 14.—Potato Starch, magnified 240 times.

But all of these experiments are not only cumbrous, even difficult and presupposing much practice in chemical experiments, but also inaccurate and insufficient. Let us, therefore, confine ourselves to such means of examination which will yield a definite result, and which we can recommend from experience. The most decisive answer as to whether potato starch is contained in flour or not is given in the first place by the microscope. The starch particles of the potato can easily be distinguished by the eye from those of wheat. They are larger, of a peculiar pear-shape, and marked with scaly lines surrounding a center which generally lies in the narrower part. If the illustration of pure wheat flour, given in fig. 11, is compared with the picture of potato starch given in fig. 14, magnified 240 times in length, the examining eye cannot long be in doubt. The mixture and adulteration of wheat flour with other less valuable grain and legume flours is most readily disclosed by the microscope.

[*To be continued.*]

The Merchants' Exchange, of St. Louis, has 1,290 members.

MILLERS' NATIONAL ASSOCIATION.

Sixth Annual Convention, at Chicago, Ill., May 13, 1879.

ORDER OF BUSINESS.

1st. Opening of the Convention at 11 o'clock a. m.

2d. Report of the Committee on Credentials.

3d. Proceedings of last Convention.

4th. Enrollment of members.

5th. Official report.

6th. Call of Standing Committees and filling vacancies.

7th. Appointment of Committee on Nomination of Officers.

8th.—Reports of Standing Committees: 1st.—State Organization. 2d—Transportation. 3d.—Insurance. 4th.—Grading and Inspection. 5th.—Patents. 6th.—Milling and Improved Methods. 7th.—Mill Machinery. 8th.—Grain for Milling. 9th.—Brands and Trade Marks. 10th.—Miller's School or College.

9th. Reports from Special Committees.

10th. General business.

11th. Report of Committee on Nominations, and election of officers for the ensuing year.

STANDING COMMITTEES.

1. *State Organizations.*—C. A. Seybt, Highland, Ill., Chairman; F. B. Mills, Minneapolis, Minn.; W. B. McActee, Baltimore, Md.; J. J. Snouffer, Cedar Rapids, Iowa; H. H. Emery, Indianapolis, Ind.

2. *Transportation.*—Edwin Sanderson, Milwaukee, Wis., Chairman; H. S. Osborne, Quincy, Ill.; C. A. Pillsbury, Minneapolis, Minn.; O. W. Baldwin, Ottawa, Kan.; J. A. DeWar, Kansas City, Mo.

3. *Insurance.*—H. A. Hayden, Jackson, Mich., Chairman; D. R. Sparks, Alton, Ill., F. L. Hubbard, Minneapolis, Minn.; J. R. Serrin, Ladora, Iowa; F. Schumacher, Akron, Ohio.

4. *Grading and Inspection.*—L. M. Norton, Chicago, Ill., Chairman; E. Goddard, St. Louis, Mo.; R. L. Thompson, Terre Haute, Ind.; C. W. Seebach, ————, Minn.; P. H. McGill, Baltimore, Md.

5. *Patents.*—Alex. H. Smith, St. Louis Mo., Chairman; S. H. Seamans, Milwaukee, Wis.; J. A. Christian, Minneapolis, Minn.; J. D. Hays, Detroit, Mich.; J. A. Hinds, Rochester, N. Y.

6. *Milling and Improved Methods.*—Joseph F. Gent, Columbus, Ind., Chairman; —— Crosley, ————, Minn.; E. F. Krieder, Jacksonville, Ill.; Homer Baldwin, Youngstown, Ohio; J. B. A. Kern, Milwaukee, Wis.

7. *Mill Machinery.*—David Gibson, Indianapolis, Ind., Chairman; Henry Stanley, St. Louis, Mo.; D. E. Roberts, Maysville, Ky.; W. Underwood, Dixon, Ill.; Chas. Miner, Wilkesbarre, Pa.

8. *Grain for Milling.*—W. P. Brown, Red Wing., Minn., Chairman; Jas. Gordon, Sparta, Ill.; Robert Colton, Bellefontaine, Ohio; Geo. Motley, Rochester, N. Y.; A. Ames, Fort Atkinson, Iowa.

9. *Brands and Trade Marks.*—Robert Tyson, Baltimore, Md.; Chairman; Philip Haxall, Richmond, Va.; J. G. Jenkins, Oswego, N. Y.; Fredk. Woodard, Staunton, Ill.; W. F. Cahill, Minneapolis, Minn.

10. *Millers' School or College.*—F. Chamberlain, Albany, N. Y., Chairman; J. B. Ficklen, Fredricksburg, Va.; John Earl, Schoolcraft, Mich.; Geo. J. Plant, St. Louis, Mo.; C. Manegold, Milwaukee, Wis.

11. *General Reference.*—Nicholas Elles, Evansville, Ind., Chairman; C. S. Baker, Red Wing, Minn.; W. Hayden, Tecumseh, Mich.; ——Dow, Davenport, Iowa; August Guye, St. Genevieve, Mo.

12. *Credentials.*—D. B. Merrill, Kalamazoo, Mich., Chairman; Jno. Crangle, ————, Mo., H. L. Halliday, Cairo, Ill.; F. Schoch, Selinsgrove, Pa.; C. D. Smith, Lincoln, Neb.; Frank Little, Sec'y, Kalamazoo, Mich.

UNITED STATES MILLER.

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MILWAUKEE, MAY, 1879.

THE Minneapolis millers have struck against a 20 per cent reduction of wages.

IN our June number we shall present our readers with a technical article on "Under Runners," with illustrations.

THE term of subscription paid for by many of our subscribers expired with our April number. We hereby call their attention to it, and hope they will soon remit for another year.

MARRIED—On Tuesday, March 25th, at the residence of the bride's parents, in Quincy, Mich., by the Rev. W. Foulks, Mr. H. Herbert Emery, of Indianapolis, Ind., to Miss Hattie D. Pease, of Quincy, Mich.

We congratulate Bro. Emery of the *Millstone*, and wish him and his bride a long and happy life.

ONE THOUSAND car-loads of grain—over 450,000 bushels—will be shipped from St. Louis to New York for export to Europe early in May via the Wabash & Toledo, Lake Shore & Michigan Southern and New York Central Railroads. Special rates have been obtained.

RODNEY MASON, Esq., the Great Mogul of the Patent Ring, has again wrestled with the United States Patent Office, and it has conceived and brought forth the Stoll reissue. 'Squire Rodney says his hopes are revived, and "he will abide with the brethren until the end."

☞ THE UNITED STATES MILLER *has the largest circulation of any milling journal published in America, and was the first milling journal started in America entirely independent of connection of interest with some machine or mill-furnishing establishment.*

THE Stoll reissue, which we mentioned in our April number, does appear to amount to something upon investigation. As the meeting of the National Millers' Association is so near at hand, and as that matter will be thoroughly investigated at that time, we defer all remarks thereon.

THE Consolidated Middlings Purifier Company have brought suits against the Joseph Lacroix Middlings Purifier Co., of Indianapolis, Ind., and Messrs. Collins & Gathmann, of Chicago, Ill., for infringement of their patents. It is said that similar suits will be commenced against other purifier manufacturers.

COL. COLLINS is happy. The Consolidated Middlings Purifier Company have sued his firm—Messrs. Collins & Gathmann—for infringement of their patents. He declares that his appetite has not been so good before for years. Now, this patent business is getting interesting. Its better than—well, even a walking match, and lasts ever so much longer.

WE hope all who receive sample copies of the UNITED STATES MILLER will favor us with their early subscription. The price—one dollar per year—is a mere trifle, and ensures you a first-class paper containing a great quantity of matter of direct interest to your trade. Do not delay, but send your order *now*. Enterprising, go-ahead millers cannot afford to be without the current milling literature of the day.

IT has been rumored that Hon. George Bain, President of the Millers' National Association, and Frank Little, Secretary, will not be candidates for re-election. Secretary Seamans, of the Wisconsin Association, has been favorably spoken of for the position. He is certainly as active and efficient a worker in the interests of the milling fraternity as can be found, and in case his name should be brought before the Convention as a candidate, he will undoubtedly meet with a handsome support. If there is to be a change, we should be pleased to see Wisconsin carry off a portion of the honors.

R. G. DUN & Co.'s Commercial Agency Report for the quarter ending March 31st, shows that during that time there were in the United States 2,524 failures, with liabilities amounting to $48,112,605, against 3,355 failures and $83,078,826 during same months in 1878. In Canada during the first quarter of the present year there were 634 failures with $11,648,697 liabilities, against 555 failures with $9,100,929 liabilities for the same period in 1878. The report shows that the number of failures in the United States have decreased over 25 per cent, while the amount of liabilities has fallen off much more in proportion. The prospects are not so flattering in Canada.

LEHMAN'S METHOD FOR TRUING MILL-STONES.—We call the attention of our readers to the advertisement of William Lehman in another column. By using his patented method he claims that there is no further use for the various patented staffs, many of which have been tried by millers all over the country. Mr. Lehman's method has been adopted in a great many mills, and cannot fail to give entire satisfaction, as it positively secures a perfectly true face, the great advantage of which is universally well known. It is true, but not generally admitted, that it is almost impossible to find a run of stones in perfectly true face. When you do find a run in perfect condition, or even approximating to it, the product therefrom will be found to be of a superior quality. It may be that the old style mill-stone will gradually pass out of use and be supplanted by rollers, but until that time comes it is a matter of the utmost importance to keep the stones true. We commend our readers to correspond with Mr. Lehman on the subject.

THE OFFICIAL CALL.

The followsng is the official call for the next meeting of the Millers' National Association:

MILLERS' NATIONAL ASSOCIATION,
PRESIDENT'S OFFICE, ST. LOUIS, March 28, 1879.

The Sixth Annual Convention of the Millers' National Association will be held at the Grand Pacific Hotel, in the city of Chicago, May 13, 1879. All members of State Associations and individual members of the Millers' National Association in States where no State organization exists are invited to be present. The ratio of voting, as decided by the Executive Committee, will be based upon the number of runs of buhrs on which assessments have been fully paid up to the 1st inst.

As recommended by the Executive Committee, a reorganization of the Association will probably take place, and it is hoped as many members as possible will attend.

GEORGE BAIN, President.
FRANK LITTLE, Secretary.

The Executive Committee are requested to meet at the Grand Pacific Hotel at 10 a. m., May 12. J. A. CHRISTIAN, Chairman.

A BAD YEAR FOR PATENTEES.

Downton vs. Yaeger Milling Company.

The above entitled case came up for hearing in the United States Court, St. Louis, Mo., April 25th, and after full consideration of all the testimony introduced, Downton's roller patent was declared invalid, as it had been anticipated. The Yaeger Milling Company and Messrs. E. P. Allis & Co., of Milwaukee, feel jubilant over the result. As matters now stand, manufacturers of rollers can go ahead and make as many and different kinds of rollers as they please without the fear of infringement before their eyes. The following letter from Henry C. Yaeger was received by Messrs. E. P. Allis & Co., April 28th:

"ST. LOUIS, April 26th, 1879.—*Edward P. Allis & Co.:* GENTLEMEN: Downton case decided in our favor. Court grants them another hearing next fall. As their case cannot be made any stronger, we may consider the patent for rolls worthless. Not a good country for patent suits.

"Yours truly, HENRY C. YAEGER."

ATTENTION, WISCONSIN MILLERS.

OFFICE WISCONSIN STATE MILLERS' ASSOCIATION,
MILWAUKEE, April 26, 1879.

I am requested to call the attention of the members of our Association to the Annual Meeting of the MILLERS' NATIONAL ASSOCIATION, to be held at the Grand Pacific Hotel, Chicago, Tuesday, May 13th, next. Every mill in the Association should be represented at the Chicago meeting, as it will be the most important one, in many respects, ever holden by the National Association.

The "Patent" litigations—past, present and prospective—will receive a large share of attention, and will require careful consideration.

It is proposed to adopt a strong legal constitution, that will bind its members more firmly together, and enable the Association to conduct its business in such a manner that the Executive Committee will labor under *no uncertainty* as to the support they shall receive, financially or otherwise, as has heretofore been the case.

A State Constitution will also be devised and recommended, which will conform to the requirements of the National Association. These are but a few of the important matters that will require your attention.

Heretofore, our Association has only been represented by a "corporal's guard." It is hoped, at this meeting, a REGIMENT will be found present from Wisconsin.

None but full paid members will be admitted to the Convention. All those that are *delinquent at the time of the meeting will be dropped from membership* in the Association. If you are behind on any assessment, *better pay up at once.* YOU CANNOT AFFORD to be dropped at this time. Those not now members can become so by paying $10 membership fee, and all assessments levied since the organization of the Association.

To those who have not yet joined I would say, the Association has fought a big battle for you, and defeated the enemy, and it is but your *honest duty* to join us, and pay your proportion of the expenses. You have reaped the benefits. Why not pay? The Cochrane patents are dead beyond a resurrection. All threats of appeal to the Supreme Court are for "bull-dozing" purposes. Though handsomely beaten in this, the enemy are still active. Another old patent has been resurrected, reissued, and is now more formidable than the Cochrane patent.

The Barter patent, too, is now coming to the front. New suits are being commenced, and new parties are in the field. If to fight, and fight successfully, it can only be done by united forces. If to compromise, the Association will secure terms for its members that would be impossible for individuals to obtain. In either case, the outsiders will be at the mercy of men whose greed is only governed by the size of the victim's bank account. Whatever compromise the Association may enter into, it will be in the interest of its members only. "Come in out of the wet," and don't fail to attend the Convention.

S. H. SEAMANS, Secretary.

RECENT PATENTS.

The following patents of interest to the milling trade were granted by the United States Patent Office March 25th, 1879:

Grain door, G. C. Banta, Kansas City, Mo.

Turbine water wheel, John C. Clime, Philadelphia, Pa.

Separator for flour mills, Isaac Morgan, Augusta, Ga.

Grain elevator, F. Taggart, Brooklyn, N. Y.

Cockle separator, Andrew Wemple, Chicago.

Machine for separating magnetic substances from grain, Cyremus Wheeler, Auburn, N. Y.

The following are the patents granted April 1st, 1879:

Ventilating mill-stones, George Helfert, New York, N. Y.

Turbine water wheel, J. Lucas, Redfield, Ia.

Middlings grinding mill, Jonathan Mills, assignee to Milwaukee Middlings Mill-stone Co., Milwaukee, Wis.

Apparatus for removing germ and fuzz from grain, S. Potts and A. Parson, Somerset, Wis.

Grain separator, Wm. S. Reeder, St. Louis.

Mill-stone pick, R. J. Wheatley, Duquoin, Ill.

April 8th, the following patents were issued:

Mill-stone exhaust apparatus, J. Q. Adams, Indianapolis, Ind.

Mill pick, James H. Cain, Cana, N. C.

Magnetic grain separator, Henry E. Cook and J. B. Thayer, River Falls, Wis.

Mill-stone driver, Wm. T. Duvall, Georgetown, D. C.

Wheat heater, P. B. Hunt, Avoca, Iowa.

Grinding mill motor, Louis Langevin, Buenos Ayres, S. A.

Diamond mill-stone dresser, Thos. McFeely, Union City, Ind.

Wind mill, J. H. Palmer, Lodi, Wis.

Grain drier, P. Provost, Minneapolis, Minn.

Grinding mill, Ezra Rhodes, Erie, Pa.

Midddlings separator, Augustus and A. N. Wolf, Allentown, Pa.

WORSHIPPING BY STEAM.—Recently a Methodist Church in Nevada expelled one of its members. He thought it the result of his pastor's spite against him, and not to be outdone in his devotions he conducts them in a rather original way. He owns a saw mill near the church. On Sunday he attaches his engine to an immense steam calliope with which he makes his instrumental music, and with the "Sweet Bye and Bye" drowns the voice of the neighboring parson.—*Louisville Courier-Journal.*

Special Business Notices.

MILWAUKEE TRADE ITEMS.

Mattice & O'Neill, of this city, have ordered a new improved Corliss engine from Messrs. E. P. Allis & Co.

E. P. Allis & Co. have sold a new 12 x 36 improved Corliss engine to the Eagle Mill Co., of New Ulm, Minn.

E. P. Allis & Co. have orders for three complete mills from Oregon,—one of 6 run, one of 3 run, and one of 2 run of stone.

E. P. Allis & Co. have an order for ten more sets of porcelain rolls for parties in England, which are to be forwarded at once.

The Atchison, Topeka & Santa Fe R. R. Co. have ordered an improved Corliss engine from Messrs. Allis & Co. for their new shops at Topeka.

Allis & Co. are building one of their improved 700-horse power compound condensing Corliss engines for J. B. A. Kern's flour mill in this city.

Mr. J. B. Alfree, of Washington, Pa., is building a mill in which he has adopted the system of the Milwaukee Middlings Mill-stone Company.

The Milwaukee Middlings Mill-stone Company have orders from Messrs. Hibbard & Graff, of Grand Rapids, Mich., for their grinding mills.

Hildebrant & Davis, of Lu Verne, Minn., have ordered an improved Corliss engine from E. P. Allis & Co. Also the machinery for a 3-run flour mill.

E. P. Allis & Co. have taken the contract to build the 4-run mill for Hoyt & Seager, of Frontenac, Minn., including all the machinery and millwright work.

E. P. Allis & Co. have received an order from the Cedar City Mill Co. of Utah for the machinery for a complete 4-run mill, including a Victor turbine wheel.

Kirby, Mattern & Pavey, of this city, have ordered a new Corliss engine from Allis & Co. Also all the machinery for their new starch works to be erected in Milwaukee.

The Milwaukee Middlings Mill-stone Company have just started up Mr. Morris Johnson's mill at Lowell, Mich., fitted up for custom work entirely on their principle.

The Milwaukee Middlings Mill-stone Company have started up Messrs. Coleman, Jackson & Co.'s mill at Centralia, Wis., which they have been overhauling and remodeling.

Allis & Co. have sold to Henry W. Barrett & Co., of Louisville, Ky., one of their improved 18 x 42 Corliss engines, which is to take the place of a Harris-Corliss engine now in use.

E. P. Allis & Co. have received an order from L. M. Dayton, of Cincinnati, for one of their improved Corliss engines, 22 x 42. This is the second engine sold to Mr. Dayton by Allis & Co. within the past few weeks.

E. P. Allis & Co. report that they have orders on their books for over sixty sets of iron and porcelain rolls, and are not only working all the men possible in their own shops but are letting out work to try and keep up with orders.

E. P. Allis & Co. have taken the contract to furnish one of their improved 18 x 42 Corliss engines with 16 x 66 steel boilers, full condensing apparatus, and all connections, to Stephen Gardner, Vermillion Mills, at Hastings, Minn. All to be finished in 60 days.

E. P. Allis & Co. have orders for 20 new Monteith threshing machines, including the horse powers and trucks. This is a trial lot, and if the inventor's anticipations are realized, from 200 to 400 will be begun at once and got ready for next year's trade.

MANUFACTURE OF OATMEAL.

When the grain has been thoroughly dried, it is allowed to cool to blood heat before being shelled. The shelling stones should be of a soft but gritty nature; not too soft, however, because if they are they generally miss kutching the grain and wear into rings too soon. The English or Newcastle stone is much used, although some millers consider it rather soft. The Esopus stone of New York ought to make a very excellent sheller, while for grinding it ought to be far superior to the French burr. It makes a softer meal than the burr, but does not, of course, hold the face so long or grind as fast. There is a quarry situated somewhere in Susquehanna County, Pa., which supplies the best stone for shelling. It was in the market for awhile in 1871, but since then the quarry has been closed, and no interest is taken in getting out the stone. The proprietor has several large farms in the neighborhood and has no desire to quarry. It is purely a sharp, coarse sandstone, and will not ring, get out of face, or glaze. It is very well adapted, too, for scouring purposes, and while superior in all respects to the English or Canadian stones, it can be sold much cheaper. This class of stone is always sold by the pound, and not the size, and as the specific gravity is much less than that of the others, besides costing less for quarrying and transportation, it can be sold for nearly half the price of the other stones. The writer has seen common sandstone taken from the quarries to do as good shelling as the best Newcastle stone, the only difference being that they should be dressed or "picked" oftener. The picking is done with a bill or sharp-pointed pick and no furrows are used. The size varies from 4 to 6 feet in diameter, 4½ feet being, perhaps, the best size. The number of revolutions vary, of course, with the size, being from 75 to 125 per minute.

When the oats go through the sheller they pass into a riddle, where the hull and dust or "dannagh" is blown off. The screen is made of No. 13 wire cloth. The end of the riddle where the shelled grain falls is generally covered with bagging or zinc, and it receives its motion from a crank at the end. It has a fall of from an inch to an inch and a half to a foot, according to the length. All the husks or shells pass over the riddle, and the grain drops through, where it is met with a strong current of air from the fan, and the dust is blown away into the dust room. All small grains fall at the end of the machine, and are put through again with a lighter blast from the fan. Particular care and attention must be given to the fan, as a great deal of loss is often occasioned by allowing too strong a current, and the shelling is not properly cleaned by a weak one. When the light grains or tailings are run through the second time, the stones will, of course, have to be lowered. The fans should be about two feet in diameter, and run at the rate of 800 revolutions per minute. When the grain is thoroughly separated from its shell and the dark brown dust has been blown away, it would be of considerable advantage to run the shelling lightly through a brush machine. Although the writer has never seen this done, he believes that it would clean it of quite a mass of dust, which must necessarily adhere to it, and the result would unquestionably be whiter and better meal. The shelling stone is "hung," not balanced. A three, and sometimes four-toed rynd, is used. The rynd is keyed on the spindle, and the process of hanging is gone through by the miller.

Sometimes the "gains" are not cut properly, and small pieces of thick brown paper are placed between the arms of the rynd and the stone until it is perfectly even with the spindle, which, by the way, must be properly trammed before the stone is put down. Some millers give the runner a "bosom" of a quarter of an inch at the eye, running out to nothing at the end of eight inches. In hanging the stone is turned round slowly until it is found to be perfectly level with the bed stone. A good plan in hanging the stones would be to have a patent eye by which the stone could be adjusted to the horns of the rynd by a thumb-screw. It would save much time, besides giving a more perfect adjustment. It is, of course, needless to inform the miller that in shelling the stones must be nearly the length of an oat kernel apart. The proper distance can only be found after starting up. The stones being without furrows the grain is brought to the periphery in a whirling way by the centrifugal force of the runner, somewhat retarded by its own weight, the grains ahead, those tumbling over from the rear and the still bed-stone, and the greater the feed up to a certain point the better the shelling.

There are always some grains not dried enough which escape and fall into the spout with the cleaned shelling. These should be guarded against, as they aid in bringing on fermentation in the meal if kept for any length of time. In order to avoid these, and also to aid in perfecting the thorough cleaning of the grain, the oats should be put through the sheller twice, care being taken to regulate the screen and draft on the fan to suit each shelling. The riddle should also be adjusted in such a way that its fall could be raised or lowered at pleasure. When careful attention is given to the shelling, and the grain is thoroughly freed from chaff and dust, then the process of grinding commences.

GRINDING.

There are various opinions with regard to the proper kind of stone for grinding oatmeal. Some assert that the French burr, with twenty-four furrows, is the best. Some say that it ought to have twenty-seven furrows; some claim eight, and a majority insist on not having any. The writer's opinion is that furrows can be advantageously dispensed with in French burr, while it might be well to put in about twenty-four furrows in an Esopus or soft stone. Say eight quarters, three furrows to each. (Quatrers in this connection do not mean quarters of the stone, but a style of dress, it may be well to remark.) Some recommend cracking, eight cracks to the inch, and others, the writer among them, no cracking at all, but to have the stone faced with a bill the same as the sheller.

The meal must be cut and not crushed, and therefore the style of dress which will granulate best is the one to use, and experience is teaching every day that the smooth face is the best for this purpose. The meal should be ground perfectly cool, as otherwise it will not be sweet and will not keep so long. The grinder is hung on a three or four horned rynd, the same as the sheller. The bosom should be sunk a quarter of an inch, the same as the shelling-stone, but should run out to three or four inches of the periphery. Four-foot stones are large enough for grinding oats, and three-foot stones can be used to advantage. A great many use a soft stone for the eye-piece where a French burr is used, which is a good plan, as it wears just about right to keep the eye sunk. An eye-piece of Esopus and a skirt of old stock French burr would make an excellent grinder, using say sixteen furrows on the burr face and eight on the Esopus up to the eye. The meal passes from the stone to the

SIFTER.

The sifter is generally about five or six feet long and three feet in width. It is made of punched zinc, with the holes far enough apart to allow the "seeds" to pass over. These holes are of various shapes—sometimes round and sometimes oblong, and are generally punched from the bottom side with a slight elevation on top. There are generally three sieves, placed three or four inches apart, one above the other, with the top one punched wider than the one below, and so on. The first one is for the large "seeds" to pass over, the second for the smaller "seeds" and "cutlings," which are reground, and the third separates the fine meal from other "cutlings," which are also sent to the stones again. The fan is about twelve to fourteen inches in diameter, and revolves at the rate of 200 revolutions per minute. The "seeds," when thoroughly cleaned, make good feed for animals, but when intended for domestic use to make "sowens," or "flummery" as some call it, it is not so finely cleaned. This sowens makes a very healthy and pleasant food, and is much used for children and invalids. Sowen is made in the following manner: The "seeds" is put to steep in an earthen vessel by pouring hot (not boiling) water on it. It is stirred and left for forty-eight hours, when it begins to sour. It is then strained through a cloth or sieve and boiled. When cooked it has somewhat the appearance of corn starch, but is much more palatable. Its taste is sour and pleasant, and even before boiling the liquid makes a very agreeable drink of a warm day. The sifter is shaken by a crank in the same manner as the "screen," but has only about half an inch fall to the foot. The speed must not only be regular but also the proper number of revolutions must be looked after, as otherwise the bolting will not be properly or evenly done. If too slow, it will allow the "seeds" to fall through, and if too fast, some of the fine meal will be wasted. The top sieve is the longest, the lower about two feet shorter, and the middle one foot. In the manufacture of oatmeal a great degree of care must be bestowed on the grain from the time it is first put on the kiln until it leaves the mill in meal, as otherwise, being the hardest of grains to handle properly, it may stand a good chance of being spoiled.—*Millers' Journal.*

EVERYBODY READS THIS.

NEWS OF THE WORLD.

ITEMS GATHERED FROM CORRESPONDENTS, TELEGRAMS AND EXCHANGES.

Louisville is to have a Board of Trade.

A. S. Cox, of Rochelle, Ill., has sold his mill.

Eifert's mills at Rush Lake, Minn., burned April 20th.

A new mill is to be erected this season at Bird Island, Minn.

The Stacy Filler has been approved by the Minnesota grain buyers.

March 1st, 1879, there were 49,007 post-offices in the United States.

An attempt was made to assassinate the Czar of Russia, April 14th.

All indications so far in Ohio and Indiana point to good crops for 1879.

There is only one miller in Congress. No wonder the old thing grinds slow.

The damage to Luck & Hathaway's mill at Oconomowoc, Wis., was only $200.

W. M. Poole & Co., millwrights, Minneapolis, Minn., were recently burned out.

A pound of oat meal is said to possess as much nutriment as 9 pounds of ham.

The water power at Sauk Rapids, Minn., is be sold soon under a decree of Court.

Caleb M. Lynch's grist and saw-mill, Frankford, Delaware, burned. No insurance.

Kansas has been blessed with copious spring rains and a beautiful harvest is predicted.

Property to the value of over $500,000 was destroyed in Philadelphia April 4th, '79.

Messrs. Luck & Hathaway's mill at Oconomowoc, Wis., burned. Partially insured.

Nearly eleven million dollars worth of flour were shipped to South America last year.

A. B. McHardy succeeds A. H. McLeod in running the flour mill in St. Johnsburg, Vt.

The Archibald mill at Dundas, Minn., is packing flour in sacks for foreign shipment.

The Globe mills at Bunker Hill, Ill., have been leased to A. W. Treat, of Neoga, Illinois.

W. L. Kidder, of Geneseo, Ill., has bought an interest in the Wabash mill, Terre Haute, Ind.

Mr. Shaw, of the firm of Shaw & Williams, millers, in East Saginaw, Mich., is dead.

A new flour mill is to be erected in Minneapolis, Minn., on the site of the old Morrison saw-mill.

Col. I. M. Sells, of Coldwater, Mich., has sold his mill for $18,000 and gone out of the business.

April 4th a great fire burned an entire business block in St. Louis, and the losses were very heavy.

May & Co.'s new flour mill at Dodge City, Kansas, will be completed in time for this year's crop.

E. & R. McGrath, millers, Hampton, N. Y., have suspended. They also have a mill at Rutland, Vt.

Wood & Kenyar, of Onawa, Iowa, are building a four-run flour mill in complete modern style.

Messrs. Bailer & Peacock succeed to the milling business of Stevens & Bailer, at Osakee, Minn.

The Michigan Central R. R. Co. will build a 600,000 bushel elevator in Detroit, Mich., this season.

Upper Egypt has suffered terribly from famine. It is reported that the worst of it, however, is past.

The first mill in Wayne county, Neb., is being built on Logan creek, by Messrs. McHenry & Dennison.

The "Peerless Mills," H. T. Pendleton, proprietor, at Wentzville, Mo., are being repaired and improved.

The California Consolidated Virginia mines which were valued four years ago at $250,000 are now valued at $8,000,000.

Rockford, Ill., has a tack factory which turns out a ton of tacks per day. It will not do to sit down on such a business.

Mase & Co.'s grist mill at Winneconne, Wis., is to be removed to Oshkosh. It will be loaded entire on barges and transported by water.

More grain is sown in Middle Georgia this season than at any time since the war, and less cotton will be planted than for twenty years past.

The Piqua Flouring Mills, Piqua, Ohio, burned April 26th. Loss, $30,000 to $35,000. Partially insured. A large quantity of cribbed corn was burned.

Mr. S. T. Hayt, of Corning, N. Y., will at once rebuild the Southern Tier flouring and grist mill which was destroyed by fire on the 22d of February last.

Memphis, Tenn., is reported to be in a very filthy condition, and it is predicted that the yellow fever will break out there as soon as the weather gets very warm.

John Hawkins, a boy of 16 years of age, had his arm caught in some gearing in the mill at Spencer, Ind., and was crushed so badly that he died soon after.

Another flouring mill is to be built at Redwood Falls, Redwood county, Minn., this summer by the Birum company. There are already three mills using the power furnished by the falls.

A great demand for American flour will come from Turkey this year. It will have to be furnished in string sacks suitable for transportation on the backs of camels and other animals.

Mr. H. Riedell, senior member of the milling firm of H. Riedell & Co., of Owatonna, Minn., died on Wednesday, the 9th inst., after a week's illness. Mr. Riedell was about 66 years of age.

Kimberly, Clark & Co., of Neenah, Wis., have purchased the Conkey flouring mills, at Appleton, Wis., together with the water power—3,000 horse power—for the consideration of $53,500.

The Minneapolis Board of Trade meets only once per month. The report for March shows a heavy increase in shipments. The shipments for March, 1876, were 596 cars, and in March, 1879, 1,336 cars.

The Minneapolis millers are satisfied with the use of magnets for removing wire and other metals from the grain before being ground. The idea is not patented, and any mill-furnisher will supply them on demand.

The Green drive-well patentees have secured another victory, this time in the U. S. Court at Indianapolis, Ind. This is the fifth U. S. Court decision in their favor, but the Minnesota farmers have concluded to fight the patent still further.

The proposed great water wheel test to be made at Holyoke, Mass., to secure the best water wheel to supply water for Minneapolis, Minn., has been abandoned, the Mayor of Minneapolis having refused to sign the contract on account of the great expense.

Messrs Woerner & Miller, of Wright City, Mo., are making extensive improvements in their mill. A new sixty-horse power engine, with a fly-wheel weighing 5,000 pounds, is being put in position, and when all the proposed changes have been made the grinding capacity will be 80 barrels of flour a day.

Olmstead Co. (Minn.) farmers are discussing the feasability of building a Grange flouring mill. Most of the flour mills built in the past few years in different parts of the West have proved failures and have passed into the hands of private owners. Such is the natural tendency of such enterprises.

At a special meeting of the flour trade, at the Produce Exchange in New York, April 16, a committee was appointed to confer with the railroads coming to New York, relative to the time flour should be held by the roads after its arrival. The grain trade has established a new grade of wheat, to be known as "mixed winter."

April 7th the Milwaukee Chamber of Commerce held their annual election of officers, which resulted in the election of Michael Bodden, President; O. E. Britt and D. M. Brigham, Vice Presidents; and W. J. Langson, the present incumbent, Secretary, and Treasurer. Mr. Langson has occupied the position for many years, and there is little likelihood of any change as long as he wishes the office.

Abraham Funk, a Menonite, at Mountain Lake, Minn., has converted two prairie boulders into mill-stones, each of about the diameter of an average milk-pan, and set up his mill in a little building about four feet square. A small wind-mill furnishes power, and Mr. Funk can grind some twenty bushels of feed per day, when the wind is favorable. Cost of the whole concern exclusive of Mr. Funk's work, about fifty dollars.

A. J. Davis, of the milling firm of Davis & Fisher, Madelia, Minn., has been arrested and held to bail in the sum of $5,000 for attempting to poison his partner. Davis was formerly a pastor of the Free Will Baptist church in Minneapolis, Minn., and has always borne an excellent reputation. It is said he gave Fisher some raisins to eat containing strychnine. Mr. Fisher was promptly treated by a physician and is out of danger. Much excitement prevails in the little city of Madelia.

S. M. Newton, of the flouring mill firm of S. M. Newton & Co., of Chippewa Falls, Wis., and until recently President of the First National Bank, made an assignment to A. J. Haywood, March 31st. The assignment will not in any manner affect the bank or the flouring mill. Mr. Newton's assignment arose from a logging matter. Last fall he went into some very extensive logging, the fact being that the returns from the heavy outlays were not equal to the immediate demands made on him.

Mr. Joseph Winslow has lately rebuilt his flour mill in Eagle Lake, in this county, and while absent at Fergus last Monday a girl named Christina Mikkleson, who is employed by him, went into the mill to shut down the water-gate. In doing so her hair became entangled in the upright shaft that is close by, and, before assistance could be rendered, her scalp was entirely torn from the front part of her head. The heartrending screams of the girl attracted the attention of some men who were working near, but not in time to save her from the terrible disaster. Her sufferings are terribly severe, but it is hoped she may recover.—*Fergus Falls Advocate, Minn.*

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We send out monthly a large number of sample copies of THE UNITED STATES MILLER to millers who are not subscribers. We wish them to consider the receipt of a sample copy as a cordial invitation to them to become regular subscribers. We are working our best for the milling interest of this country, and we think it no more than fair that our milling friends should help the cause along by liberal subscriptions. Send us One Dollar in money or stamps, and we will send THE MILLER to you for one year.

M'LEAN'S Millers' Text Book and the UNITED STATES MILLER, for one year, for $1.25. Order now. Send money or postage stamps.

CYRENUS WHEELER, jr., of Auburn, N. Y., has taken out a patent for separating magnetic substances from grain. The claims are rather broad.

JONATHAN MILLS dropped in on us a few minutes in the early part of the month. His newly invented bran-duster is now in the market.

POSTAGE stamps taken in payment of subscription to the UNITED STATES MILLER and the Millers' Text Book. $1.25 pays for both for one year.

We will send a copy of the MILLERS' TEXT BOOK, by J. M'LEAN, of Glasgow, Scotland, and the UNITED STATES MILLER, for one year, to any address in the United States or Canada, for $1.25. Price of Text Book alone, 60 cents. Send cash or stamps.

J. W. OWEN, of Niagara Falls, N. Y., who has for 12 years successfully represented the house of Messrs. Howes, Babcock & Co., of Silver Creek, N. Y., has retired from business and settled down to enjoy the balance of his life in domestic peace and quietness.

HOPPIN, of the *N. W. Miller*, has been talking about some of Jonathan Mills' poetry every once in a while for the past two or three years, but don't give us any of it. Come, Al., give us a few lines. We know it will be solid—unless the germ has been extracted.

THE English Roller Patent case, entitled Wegmann v. Corcoran, Witt & Co., in which judgment was sometime since rendered in favor of the defendants, has been appealed by the plaintiff. A final determination of the suit will probably be made during the present year.

LOOK HERE.—Every mill-owner, miller, millwright and apprentice should have a copy of the Millers' Text Book, by J. M'Lean, of Glasgow, Scotland. Price 60 cents; or the UNITED STATES MILLER, for one year, and a copy of the Text Book for $1.25. Postage stamps taken.

All articles intended for exhibition at the "World's Fair," to be held in Mexico, commencing Jan. 15, 1880, will be admitted free of duty, and no charge will be made for space or storage.

HOW TO MAKE AN EMERY WHEEL.—Take a smoothly-turned wooden wheel, and cover the same with leather, devoid of grease, and coat the leather surface, a portion at a time with good glue; immediately roll the glued surface in emery spread out on a board.

JAMES H. THORP, of New York, has taken out a patent for a grave. Truly, this patent subject is getting to be a *grave* business. There is one consolation in this case, however, the infringer can stand long and loud knocking by the demander of royalty for the use of his patent.

WE notice that one of our contemporaries publishes the names of millers throughout the country that give chattel mortgages. This seems a little rough on the millers. It's bad enough to have such facts published in the confidential sheets distributed to customers of commercial agencies.

Advertisers will consult their own interests by patronizing the UNITED STATES MILLER, *which circulates almost exclusively amongst the flour milling class. It has the largest circulation of any milling paper published in America, and was the first independent milling journal started in the United States not being connected in interest with any patented machine or milling supply house.*

THE Chicago & Alton Railroad Company has tendered George Bain, President of the National Millers' Association, a train consisting of engine, baggage-car, and four Pullmans for the conveyance of millers from the South and West to Chicago to attend the regular annual meeting of the Association in Chicago May 13th. The train will leave St. Louis Monday evening, May 12th, and all millers whose route lies through St. Louis should notify President Bain early, if they can be on hand in time to take his special train, so that ample provisions for room can be made.

TUNNELING THE DETROIT RIVER.—Mr. Vanderbilt is going actively at work to carry out the important transit improvement of tunneling the river at Detroit. Information has been received at that city to the effect that Mr. Vanderbilt has awarded the contract, and that work is to be begun immediately. The price is stated to be $1,500,000. The tunnel will extend from Stony island to Anderson, Ont., a distance of 3,700 feet, with double arches for a double track, 18 feet high and 15 feet wide.

COL. W. L. BARNUM, Secretary of the Millers' National Insurance Company, of Chicago, spent a day or two in Milwaukee during the past month, and favored us with a call. The Colonel informs us that his company is in fine financial condition, and the business is steadily increasing. The statement made Jan. 1st, 1879, shows assets, $388,365.76; liabilities none. Income for 1878, $149,485.04; losses and expenditures during 1878, $45,179.61. Jacob Barns, of Grand Rapids, Mich., is the President, and Col. W. L. Barnum, Chicago, Ill., Secretary.

A somewhat novel stratagem was recently resorted to by a Leicester, England, manufacturer during a strike. It appears that a dispute existed between his workmen and himself, in reference to the prices to be paid for riveting and finishing boys' boots. As no satisfactory arrangement could be arrived at, a strike followed, which continued for several weeks, at the expiration of which, the employer hearing that several shoemakers in the riveting branch, had, owing to the prevailing distress, been compelled to seek temporary accommodation in the workhouse, applied to the parish authorities to supply him with riveters and finishers. The guardians granted the application, and had not the dispute been eventually settled amicably, it is said they would have compelled the inmates to have accepted the work or quit the institution.

Forsythe & Co., of Spencer, Mass., have sold their flour mill to Jas. Capen & Co.

A WORD TO PRACTICAL MILLERS.

We received a letter not long since from a millwright in England in which he said: "Journeymen millers do not seem to study or try to improve their knowledge of milling. They are satisfied to work along in the same old worn rut, and a new idea seldom gets into their heads unless some traveling millwright from some of the great milling centres chances to come along and tell or show them something new."

This statement is too true, and it can also be applied to a good many millers in this country, but happily there are many journeymen millers as well as owners that are enterprising, inquiring and practical men, who will study and consequently improve their minds, mills, products and the contents of their pocket-books. A practical miller should use his brains as well as his hands. He should strive to keep himself posted by procuring all good books published on the above subject of milling, and above all should read carefully and attentively the milling journals of the day. The publishers of these journals pick up an idea here and there and put it into shape and publish it. It may be crude and undeveloped, but a studious, ingenious man may sieze upon it, develop it and make some important discovery —Take the benefit of the experience of others. It is not necessary that you should have your own leg cut off to find that such an operation is painful. Make intelligent use of your brains and save manual labor. It is not disgraceful to work hard, but a man is foolish to work hard when there is no occasion for it. The question of economical milling is a very important one—we *must, can* and WILL be able to raise grain, make it into flour and deliver it in foreign markets *cheaper* than they can raise it and manufacture it themselves. This can and will be done by means of the efforts of close-thinking, ingenious millers who will invent the machinery necessary to be used to produce such a result. The science of milling has made wonderfu. strides in the past decade, and we predict that still more wonderful changes will take place in the coming one. A country miller recently said to us, "we can't compete with your city millers on the merchant work because we havn't got the machinery, and if we had we couldn't get a miller capable of running it without paying a very high salary." It is true in a great measure. There is a demand for thoroughly posted millers, and it is only once in a while that you find such out of employment. To the young men just beginning to learn the trade we would especially commend them to bear these foregoing remarks in mind. *Study* the science you are trying to learn. Learn all that has been learned and try to learn more. Experiment when necessary, but learn from the experiments of others when possible. Read some or all of the current milling literature of the day, and our word for it, the result will in the end be satisfaction with yourself and money in your pocket.

HARRIS-CORLISS ENGINES.

Wm. A. Harris, of Providence, R. I., manufacturer of the well-known Harris-Corliss engines is now making his annual trip to the West to visit those who contemplate putting in new engines in their flour mills or other manufacturing establishments. The merits claimed for these engines are summed up as follows by Mr. Harris:

Stock and material the best of their respective kinds. Shafts and forgings of hammered wrought iron (do not use cast shafts.) Cylinders of hard, strong and fine iron. Piston rods of homogenous steel. Valve stems and other bronze castings of pure ingot copper and tin. Large bearings and wearing surfaces all substantially arranged to take up lost motion occasioned by wear. Ample lubricating arrangements for the lubricating of all bearings, and in the case of flour mills, stoping to oil crank, pin and crosshead wrist is entirely avoided. Ample port openings, thereby insuring full boiler pressure on the piston and a free exhaust without back pressure. Regularity of speed under varying loads and steam pressure. No part of the regulating medium operates through stuffing boxes or in any manner is an actuating medium of the valve motion, or enters the steam chest and thereby be out of sight of the engineer, and subject to the corrosive action of steam and oil. Stop-motion on regulator, which effectually stops the engine, preventing it from running away whenever the regulator by any means fails to perform its office. An arrangement of drip-collecting devices, enabling the engineer of neat habits to keep his engine and engine-room floor clean. Accessibility of all its parts—a distinctive feature, and praised by engineers. Patent vacuum dash pots, insuring immediate and sure closing of valves, and enabling the engine to run at any desired speed. Babbitt & Harris' patent piston packing has been proved to be the best now in use. Patent self-packing valve stems, dispensing with stuffing boxes and the labor and use of packing. Recessed valve seats, preventing shoulders being worn on them. (This is a serious defect in other Corliss engines.) All the small parts are made to guages, and carried in stock. My engines at remote distances can be repaired as soon as Express Co. can return with a duplicate piece. Send order by telegraph for duplicate parts. And, to sum up all the foregoing advantages, economy of fuel, repairs, oil, wear of engine and boilers, reduction of boiler pressure, and in fact all that relates to the economical production of steam power.

Mr. Harris addresses a circular, of which the following is a copy, to mill-owners throughout the West:

PROVIDENCE, R. I., April 1st, 1879.—*Gentlemen:* I intend making an extended trip through Ohio, Indiana, Kentucky, Illinois, Missouri, Kansas, Iowa, Wisconsin, Minnesota, Nebraska and Michigan, and shall visit those manufacturers from whom I get a response to this circular.

I have located many of my engines in the above States, and would refer parties to those whose names appear in the list of testimonials published in my last catalogue. My correspondence, also, has been quite extensive with those who have seen my engines in operation, and I now propose to visit not only those with whom I have corresponded recently, but all who desire to confer in detail with me on the above subject, making estimates, and furnishing drawings for the same.

With this object in view, parties meaning business may send particulars to my address, Providence, R. I., where it will be forwarded to me on the read, as I shall keep myself in daily telegraphic communication with my office. Before ordering elsewhere, await my arrival, and confer with me in person, as my experience in locating and determining size of engine required will be of the greatest benefit to you, and no doubt save you money.

Do not fear that there will not be time enough to fill your order, as I am able with large facilities and many engines always in process of construction, to fill any order in from three to five weeks. Respectfully,

WM. A. HARRIS.

IMPORTANT NOTICE.

TO THE PARTY RECEIVING THIS PAPER WHO IS NOT ALREADY A PAID SUBSCRIBER.

We hereby extend to you a cordial invitation to become a subscriber to the UNITED STATES MILLER. We shall endeavor to make it of the greatest possible use and benefit to the milling fraternity, and no mill should be without it. The best talent that we can obtain in this and other countries will contribute to its columns, which will also be enriched by carefully translated articles on subjects of interest to the craft. Subscription price, $1. Enclose money or stamps in an envelope, seal carefully, and send at our risk. By return mail you will receive a receipt therefor. Address

THE UNITED STATES MILLER,
Milwaukee, Wis.

SEVERAL commercial travelers were lately discussing the condition of trade, while seated around the stove in a hotel. Several complained that collections were unusually slow. "I have no trouble in making collections," said a stranger. "What house do you travel for?" asked some one. "Uncle Sam's," he replied. He was a Government revenue collector.

IN another column we publish a translation of the report of the manufacturing and financial business of some of the leading Hungarian mills. A careful study of this report and the evident profits of milling on the Hungarian system will be of service to our merchant millers who are contemplating changes. The pure Hungarian system will probably never be satisfactorily tried in this country, but a modified system seems to have many admirers.

Cut This Out.

"United States Miller" Subscription Blank.

We hope the milling friends of the UNITED STATES MILLER will be as liberal to it as it has been in the past, and will be toward them in the future. Subscription price, one year $1.

We shall be pleased to have an early response to this. Fill out the blank below, enclose with money in an envelope, seal carefully and send at our risk. A receipt will be sent by return mail. Address all communications to the

UNITED STATES MILLER,
Milwaukee, Wis.

Editor of the UNITED STATES MILLER, *Milwaukee, Wis.—Sir: Send one copy of the United States Miller for one year, for which find enclosed* $1.00.

Name .....

Post-Office.....

County .....

State .....

ABOUT STEAM BOILERS.

[CONTINUED.]

A boiler 24 feet long, 42 inches in diameter, with two flues, exploded. It was stated at the investigation that only 50 lbs. of steam was being used. The original thickness of the iron was only 3-16 inch. At the point of rupture the iron was corroded to the thinness of paper. No person was hurt, but the building was badly damaged. The diagram, figure 8, represents the appearance of the boiler after the explosion.

It is reasonable to suppose that if the boiler had been thoroughly inspected, the defect would have been discovered, and the accident prevented. There are steam users who fail to appreciate the advantages of thorough inspection. A "certificate," if secured at a very low rate, is all that is wanted.

The following report of a boiler explosion from a special agent of the Hartford Steam Boiler Inspection and Insurance Co., of Hartford, Conn., who visited the scene, will be read with interest:

"The boiler was of the locomotive type—a variety used in the oil regions of Pennsylvania—having a narrow base to the fire-box and a tapering waist; base, 26 inches wide by 4

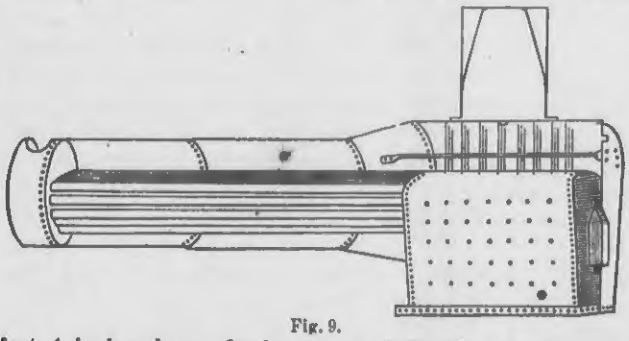


Fig. 9.

feet 4 inches long; fire-box, 20 inches wide by 3 feet 10 inches long; front, 4 feet high by 3 feet wide at axis; dome, 22 inches diameter, by 30 inches high, measured from crown of shell; length over all, about 12 feet; diameter of barrel, 30 inches, containing 28 tubes 3 inches diameter by about 8 feet long; thickness of shell, dome, and fire-box, ¼-inch iron; tube-sheets, 5-16. The boiler was located in an open field some distance from the works, and covered by a shed; it was used to furnish steam for a small pumping-engine in a large well which was in process of excavation.

The boiler as it originally appeared is

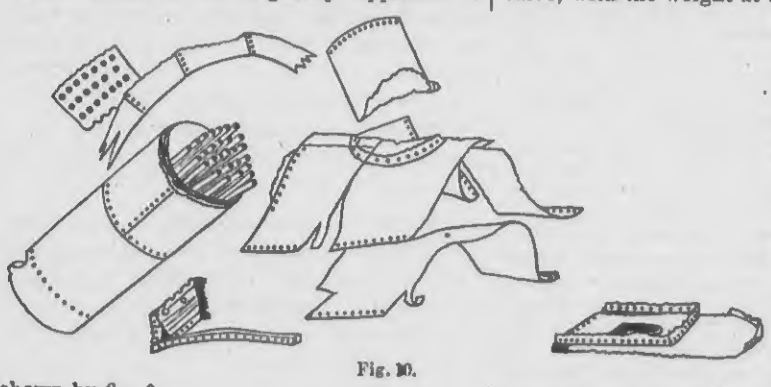


Fig. 10.

shown by fig. 9.

"When the accident occurred—Sunday, about 3 A. M.—two men were in or near the shed; one was instantly killed, and his body thrown a distance of 120 feet from the shed; the other, who acted as engineer, was thrown a considerable distance and fatally injured. He died the following Wednesday morning. He said he had started the injector to feed water into the boiler when 'she blew up.'

"The shed was literally reduced into kindling-wood and scattered over several acres of ground. The boiler was torn into 12 principal fragments, besides small pieces of plate, stay-bolts and braces, which were scattered in all directions. The barrel of the boiler containing the tubes was thrown end over end, nearly in a line of its axis when in position, a distance of about two hundred feet, the tubes left bare by the tearing off of the waist, plunging into the ground, whence it bounded some distance further near the place where the taper-sheets that formed the waist had alighted.

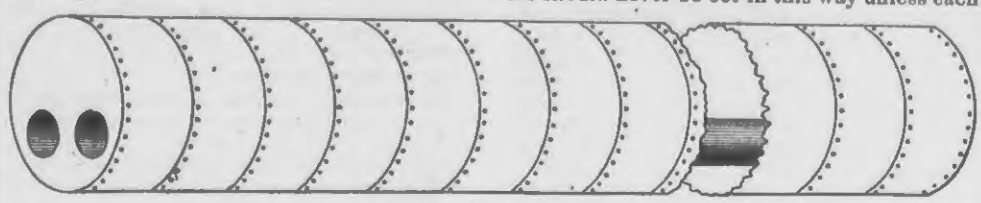


Fig. 8.

"Most of the other parts were strewn in a curved line to the left, each piece going further until the most remote and largest landed about 1,500 feet to the left. The crown and sides of the furnace were composed of one sheet, which seems to have been flattened down upon the grate-bars, then turned once over upon the ash-heap, with its fire side up, and the fusible plug in perfect order in the middle of the sheet.

"A part of the tube-sheet, with half the wrought-iron basesill attached, was dropped upon the tool-box of the diggers. The front of the shell, with the front of the fire-box attached, was thrown about 600 feet in a direction nearly opposite to that taken by the barrel.

"Nothing remained to mark the spot where the boiler stood except the grate-bars, which were forced into the ground that formed the floor of the ash-pit.

"The boiler was nearly new, and fitted with a common lever safety-valve and three guage-cocks. Fire-box was stayed to shell by screw stays, spaced about 5½ inches apart and headed over inside and outside. About 20 of those that supported the furnace-crown were attached in the same way to the 24-inch circle of the shell enclosed between the flange-rivets of the dome

"The whole load upon a 24-inch circle of the center of the crown-sheet, at 120 pounds per square inch (a pressure that the safety-valve, with the weight at the end of the lever, even allowing it to be in working order, would have permitted), was 54,000 pounds or 27 tons. The body of the safety-valve was tapped to receive the steam-pipe from the boiler, also the steam-pipe to the engine and the escape-pipe from the space above the valve, in the usual manner. The wings of the valve fit nicely into the chamber, and the tendency of the long steam-pipe, perhaps not properly supported or twisted out of its natural easy position, acting as a long lever on this valve body, is to distort the parts and pinch the wings so that no ordinary force would move the valve from its seat. It is said that this boiler had been worked at a pressure of 130 pounds, which would probably be quite sufficient to weaken this weak part of the boiler, and the disaster may have occurred from want of strength to sustain such a load any longer. The pump, which was located a considerable distance from the shed, may have stopped from accumulation of (water) condensed steam in the steam-chest. The steam would rise until the weakest part let go, and with an inoperative safety-valve no warning would be sounded to rouse the drowsy attendants." The wreck is shown in fig. 10.

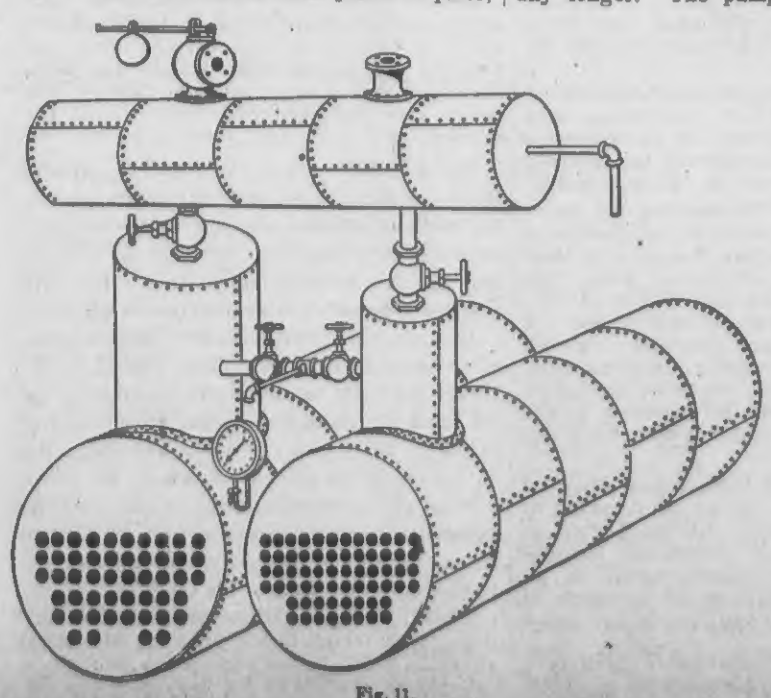


Fig. 11.

A very dangerous method of setting and connecting boilers is that where two boilers are provided with only one safety valve, and yet each boiler is provided with a "stop-valve," that is, valves so situated that either boiler can be shut off when not in use. The danger here is that when the idle boiler is put into use the attendant will forget or neglect to open the stop-valve, and, there being no outlet to the *one* safety-valve, the pressure increases until the surrounding metal is unable to resist the internal pressure, and an explosion occurs. Boilers should never be set in this way unless each boiler is provided with its own safety-valve, located on the shell of the boiler. We have known of several serious accidents arising from this style of fitting: A case occured during the past year. The owners of the boilers were substantial men, and had no adequate idea of the responsibility wnich they incurred. Their attention was called to the danger, and they evidently intended to give it early attention, but failed to do so, and a serious disaster followed. Fig. 11 shows the original condition of the boilers. It appears that for some reason one boiler had been shut off, and the steam gauge between the boilers removed for repairs. The boiler was fired up, and a destructive explosion occurred. Fortunately no lives were lost. There are many boilers through the country set in this way, and serious accidents have occurred and will occur so long as this practice is followed. Portions of the boiler were thrown from 300 to 700 feet. Figs. 12, 13, and 14 will show the manner in which the iron was torn. Fig. 12 represents the top of the steam drum. Fig. 13, rear end of left-hand boiler, which was thrown some 225 feet. Fig. 14, front end of left-hand boiler.

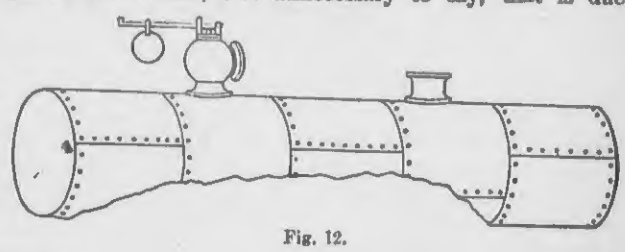


Fig. 12.

The dangers incident to the use of steam can in a great measure be removed if steam users will study the matter more carefully. It is always economical to surround boilers with intelligent care and management; to have them set on correct principles, with all attachments and appliances properly located, so that especially every safety appliance shall perform its functions freely and unobstructed.

WESTERN MILLING AND COGNATE INTERESTS.

The flour milling industry of the Northwest has made wonderful progress during the last twenty-five years, having proceeded parri-passu with the transfer of the wheat belt from the Gennessee, Ohio and Wabash Valleys to the upper Mississppi Valley. Twenty-five or thirty years ago the heart of the milling interests in this country may be said to have been in Northern New York, when Gennessee flour, made of the choice wheat grown in that section, with the old Haxall and Gallego brands of Virginia, was regarded by consumers as the ne plus ultra of bread material. But the Gennessee flour of to-day does not hold the supremacy that it did a quarter of a century ago. So far as the grain is concerned, our New York millers are, of course, on an equality with their Northwestern competitors, but the latter seem to have outstripped the former in devising new methods and improvements in the conversion of wheat into flour. What is called new process milling was, we believe, first adopted in the Northwest, and the manufacture of improved mill machinery has become one of the most important industries of that section. The millers of other sections, however, have not been slow in discovering the excellence of the product of the leading Northwestern mills, or of the methods of its production, and the consequence is a general improvement in the grades of flour over those of former times. A quarter of a century ago, or more, the exports of breadstuffs consisted almost wholly of flour because of its relative cheapness, and the off-fall it yields for stock-feeding purposes, the latter being a matter of no small consideration in a country like Great Britain, whose limited agricultural area does not admit of an adequate production of stock provender. Of late, however, the proportion of flour to wheat exports has increased, a fact believed to be due to the improvement in the grades of the former and the reduced cost of conversion of which we have spoken, together with the system of through shipments by rail and steamship to Europe and elsewhere, at comparatively low transportation charges. From late statistics, it appears that the number of flour mills in four of the Northwestern States—Illinois, Wisconsin, Iowa and Minnesota,—at the present time is nearly three times as large as it was eighteen years ago, the aggregate number in 1878 having been 3,600 against 1,338 in 1860. Latterly a considerable portion of the flour exported has been in sacks, because, presumably, of its relatively smaller cost to the consumer. Not many years ago most of the little oat meal then used in this country was imported from Great Britain and Canada, but mills for the production of this nutritious food have sprung up in various parts of the country, and their product has become an important item in the list of exports.

In this connection, it is of interest to note that a variety of collateral manufacturing industries have followed in the wake of the growth of the flouring mill interest in the West and Northwest, such as cotton, woolen, bagging, agricultural machinery, and other factories, this class of products not long since having been drawn almost wholly from the older States. It is, indeed, difficult for the residents of the Eastern States, who have not had ocular demonstrations of the fact to realize the wonderful industrial development of the upper Mississippi Valley that has taken place within twenty-five years,—a development, it is unnecessary to say, that is due more to our system of railways than to all other agencies combined. But great as has been this development, it promises to be even more marvelous in the future than in the past, judging from the movement of population from the East to West, which for 1878 is computed to have been not less than 600,000. Of this number Nebraska received 100,000, Minnesota 50,000, and Kansas over 100,000. Dull business in the old States is the cause of this hegira of population, as it was of all movements of the kind. People who are out of employment and have saved a little money, naturally begin to inquire about the West. If

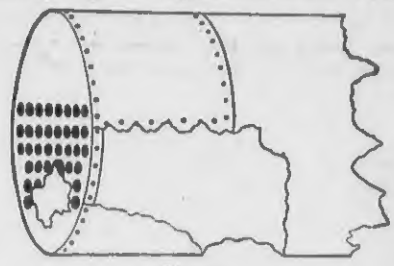


Fig. 13.

they can get a small farm, a degree of independence is assured, if they do not make much money. The West has been settled by immigration within half a century. A fact of more than ordinary significance is the remarkably large sales of new land for actual settlement reaching last year 14,000,000 acres, mostly to native born citizens. The Government sales were not quite 8,000,000 acres; the remainder was made up of railroad sales, and large sales by some of the States of land ceded by the Federal Government. Of the whole number of immigrants to the United States last year, more than one-half went

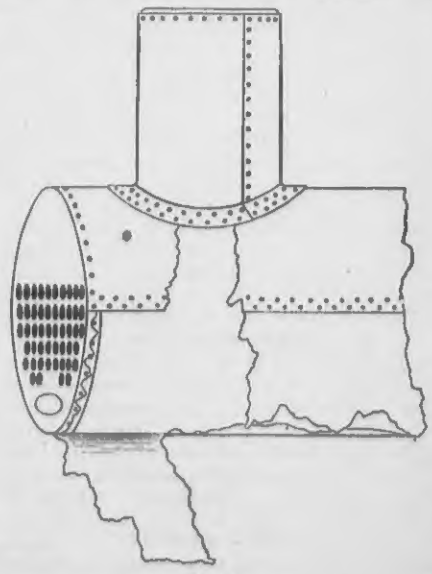


Fig. 14.

South and West. This work of reclaiming the waste places of our broad domain, and making them to blossom as the rose, is one of the most hopeful indications of the time, the beneficient effects of which will make themselves more and more manifest as the years roll on.—*N. Y. Shipping List.*

The failure of Albert H. Smith, miller, Lockport, N. Y., is announced.

MINNESOTA MILLERS.

A Large Meeting of the Fraternity Assembled in Minneapolis.

A State Organization Completed and Strong Articles of Agreement Entered Into.

The Minneapolis Millers Spread a Banquet at the Nicollet, to which the Visitors are Invited.

A very important meeting of the State Millers' Association was held in Minneapolis April 8th. The Covention assembled at 10:30 A. M., in the gentlemens' parlors of the Nicollet House. About forty members were present, among the number the following:

E. L. Baker, Red Wing; W. P. Brown, Red Wing; T. C. McClure, St. Cloud; John M. Cole, Rochester; Geo. F. Strait, Shakopee; H. Williams, LaCrosse; W. H. Officer, Austin; S. C. White, Hokah; N. P. Clarke, St. Cloud; A. Seeback, Red Wing; H. Hammond, LeGrand, Iowa; W. W. Engle, Austin; Harry Miller, Winona; A. L. Sackett, St. Peter; Gordon E. Cole, Faribault; J. J. Snauffer, Cedar Rapids; Frank Nicolin, Jordan; S. W. Mears, Hastings; S. D. Foss, Jordan; J. A. Christian, Minneapolis; C. A. Pillsbury, Minneapolis; W. D. Hale Minneapolis; W. F. Cahill, Minneapolis; S. S. Brown, Minneapolis; Loren Fletcher, Minneapolis; D. R. Barber, Minneapolis; E. V. White, Minneapolis; C. T. Hobart, Minneapolis; F. B. Mills, Minneapolis; W. H. Dunwoody, Minneapolis; F. S. Hinkle, Minneapolis; W. H. Hinkle, Minneapolis; Leonard Day, Minneapolis; H. E. Newton, Minneapolis; John Crosby, Minneapolis; D. M. Syme, Minneapolis.

The Secretary, Mr. F. B. Mills, submitted his report, which was as follows:

Mr. President and Gentlemen: At our last meeting, held Nov. 13, 1878, there were reported to you ninety-four members, embracing 526 run of stone. Since that date there has been paid into the treasury from old members assessments on twenty-three run, leaving eighty-six on which the first assessment of $25 was paid still delinquent on the last one of $15. In the meantime there have been new members received owning thirty-nine run, while old members have added to their original numbers thirty-five, on which the last assessment *only* has been paid, making our present membership number 105 firms, operating 623 run of stone, not including any of those who have not yet paid their last assessment. This is undoubtedly the best showing that can be made by any State represented in the National Association, and our Minnesota millers are well worthy the commendations they have received for the faithful manner in which they have stood by their executive committee and paid their assessments. Still, I fully believe that in the number of individual millers represented and amount of real benefit it is capable of affording, our association is still far behind that what we ought to make it. We are now just on the eve of a great victory that is well worth many times the labor and money it has cost, the result of which will be to save not only in this State but every State in the Union thousands of dollars. And too much praise cannot be given to the faithful men who have stood in the front of the battle and steadily, amid many discouragements, with a grevious lack of both material and moral support from those on whom they had a right to rely for both, have resisted every suggestion to compromise, at times taking upon themselves heavy financial responsibilities and at much personal inconvenience, steadily pushed forward, until the present grand victory has crowned their labors. This, however, is but one of several similar claims, only to be squarely met by combined effort through thorough organization. The purpose of defending ourselves against unjust claims, though an important one, and the one that has thus far almost entirely engaged our attention as it seemed the most directly to appeal to the pocket, is far from fulfilling the objects for which the association was organized, which were broadly declared to be *for the mutual improvement, benefit, information and protection* of its members, and in these respects we must frankly confess that many of the State associations are far in advance of our own. The first thing undoubtedly to be done that our association may be of the highest benefit to us, of which it is capable, is to reorganize upon a thoroughly sound and legal basis—a matter fully set forth in the official call for this meeting, and the accompanying address from the national executive committee, and at this point I would say that I am in the receipt of communications from some of our leading country millers asking that some other basis than simply the number of run of stone be adopted for assessments, as they claim that with the improved machinery, rolls, etc., adopted by the leading merchant mills, the present method gives the country and custom miller an undue proportion of the burthen. Some ask that both the rolls and stone be counted, and others that the quantity of flour manufactured be the basis. As the assessments are but a mere moiety in comparison to the benefits accruing, this point seems to me to be hardly worthy of controversy, only that as far as possible all should be harmonious and satisfactory. When our re-organization is effected there are several prominent points that should have our immediate attention. Among the first would be *seed wheat.* It is well known that of late years there has been a disposition among our farmers to use more or less soft varieties in hopes to increase their yield.

The result has been in many localities to seriously deteriorate the general product for making the best grades of flour. Combined with this, we have this season another great danger to contend with. Our last year's crop was seriously injured, resulting in a large quantity of blighted and imperfect wheat. Although this wheat may sprout, and, perhaps, under favorable circumstances, bear a fairly healthy stock, yet it is universally conceded by all seedmen that the more healthy and better the seed sown the more assured a bountiful harvest. If the fullest development of a plant of any description is desired, the best ripened and most perfect seed is selected, and by following this course for a series of years the most remarkable results have been attained; while we well know that by following the opposite course the reverse would be inevitable, and the finest fruit or flower become worthless. Again, the simple changing of the seed from one locality to another often proves of the greatest advantage, and I fully believe that it would abundantly pay every miller in the State to use his utmost influence to have the farmers in his locality secure the best seed attainable, acting as agent for them, securing good No. 1 wheat from the Northern Pacific or elsewhere and exchanging with them on reasonable terms, thereby in a measure assuring himself a better product to grind the coming season. The soft varieties can only be rooted out by a discrimination in price and determined and combined efforts of millers and dealers. Another matter that would seem worthy of attention is insurance, embracing means of protection against danger from fire, dust explosions, etc. Several of the State associations have already done something in this direction—enough to demonstrate its practicability as at least a great help to carry this burden. A committee was appointed at our semi-annual meeting, May 8, 1878, but probably owing to their whole attention being engaged on patent cases then pressing, they have failed to report.

With the aid of Behrn's patent exhaust for arresting all dust from the mill-stone, and the improved dust rooms invented by Gov. Washburn for arresting the dust from the purifiers or some similar devices, there is no good reason why our mills should not be kept clean and free from dust and the measure of risk largely reduced. The close communionism formerly exhibited among our millers is happily passing away and there can be no doubt that a more free and open discussion of new machinery, contemplated improvements, methods of milling, etc., by our wide-awake and energetic millers will not only save much unnecessary expenditure, but do much to enhance the value of our product and place Minnesota flour where it belongs—*the leading flour of the world.*

For the remaining object of our organization, the information of our members, our by-laws originally provided for in section seven, in which it was made the duty of the Secretary, in connection with other officers of the association, to gather all information obtainable in relation to crops, stocks of grain and millers' products, and other matters of general interest, to be published in the form of a private circular for distribution among members. I need not say this has been thus far almost a dead letter in our association, the entire attention of its officers being absorbed in the defense of claims against its members. There is no doubt, however, that with the hearty co-operation of *all*, our membership statistics might be obtained that would be of great advantage to all.

But I have already extended this report much beyond its original intent, and thanking you for your forbearance, I would respectfully ask for these and kindred topics your careful consideration.

F. B. MILLS, Sec'y.

A committee of three consisting of Messrs. C. A. Pillsbury, E. L. Baker, and E. V. White was appointed to call the attention of the Department of Agriculture to sending seed wheat to this State.

Mr. Christian moved that the Stillwater mill of Isaac Staples be admitted to full membership upon payment of $25 per run.

Messrs. Syme & Co., Russell, Heinline & Co., and S. C. White & Bro., were admitted on the same terms.

Mr. Pillsbury moved that all millers who have paid $15 only, shall be assessed $10 per run additional, and shall then be admitted into full membership with all the privileges thereto appertaining, including equal interest in all funds on hand.

THE ARTICLES OF AGREEMENT.

The millers then proceeded with the consideration of the articles of agreement for a new and legal organization. As finally adopted the articles are as follows, and as the association is the first of the State associations to meet, they are of particular importance. Similar articles are to be considered and will probably be adopted in other States, to complete an organization of which the National shall be the central government:

The undersigned, millers engaged in the manufacture of flour and meal in the State of Minnesota, hereby associate ourselves together as the "Minnesota Millers' State Association," for the purpose of mutual benefit and protection in their said business. And they do, each by his signature hereto affixed, agree to be severally bound by these articles of agreement:

1. The officers of this association shall be a President, two Vice Presidents, and a Secretary and Treasurer. The last two offices may be held by the same person. There shall be an executive committee, composed of three members in all, the President of the association being *ex-officio* a member of the committee. All these officers shall be elected at the annual meeting of the association for the term of one year and shall serve until their successors are duly elected.

2. The annual meeting of the association shall be held on the second Tuesday in April, and special meetings may be called at any time by the President or executive committee.

3. The members of this association shall also be members of the Millers' National Association, and the Secretary of this association is hereby authorized to enroll the names of the undersigned as members of the said National Association.

4. It shall be the duty of the executive committee of this association to cause any claim for infringement of patents in milling processes or machinery, hereafter made, against any member in good standing of this association, to be duly investigated, and if advised that such claim is invalid, they may in their discretion cause the same to be defended by the association, and may employ such professional or other assistance as they may deem necessary. The executive committee is also authorized to arrange with the owners of meritorious and valid patented improvements for reasonable terms for the use of the same by members of this association. *Provided*, That all the action by the executive committee of this association in reference to patent claims shall be in harmony with and subject to the action of the executive committee of the National Millers' Association, and the assessment by the National Millers' Association upon its members, for any year within the limits hereinafter agreed to be paid, shall be first collected by the executive committee of this association from the members of this association for the said National Association before any assessment is made for the benefit of this association alone for that year.

5. Each of the undersigned hereby agrees to pay on demand the amount of any assessment made by the executive committee of this association, or by the National Millers' Association for the promotion of mutual protection or for the common benefit in any manner deemed advisable by said committees, or either of them, not exceeding in any one year, for all purposes, including both the State and National Associations, the sum of $15 for each run of buhrs, or its equivalent in capacity of other machinery as the executive committee may determine, which the undersigned may operate upon wheat or its products. *Provided*, That no assessment shall be made by the executive committee of this (State) association, in any one year, for purposes of this association, until the amount of assessment made for that year by the National Association shall have been paid.

6. The assessments so authorized may be made in amounts, and at times, within the limits hereinbefore fixed, to be determined by the executive committees of this association and of the National Association in their discretion, and each committee may apply funds so received to any lawful purpose of mutual protection or common benefit in its discretion, and the members of the executive committee of this (State) association, as constituted at any time, are hereby empowered, as trustees of an express trust, to sue for and recover in their own names all assessments made upon the undersigned, whether for this or the National Association.

7. The defense of any patent suit by this association or the National Association, as above provided, shall be managed and directed by the executive committee of the association by whom the defense is made; and no settlement or compromise of such suit shall be made except upon terms accepted by such committee for the benefit of all members of such association who may use the devices or processes in controversy. Any member so sued and defended, who shall settle or compromise his case without the consent of the executive committee having the same in charge, shall refund to the association, at whose expense the defense shall have been made, all sums expended in that defense by such association.

8. Any member failing to pay assessments, made as herein authorized, within ten days after demand, may, on vote of the executive committee of this association, be removed from the list of members of this association.

9. This agreement shall continue ten years and in case any of the undersigned shall leave the milling business within that time, he shall be released from his obligations under this agreement on paying all assessments of this association and the National Association for the year then pending, provided that any member, on leaving the milling business, may, with the consent of the executive committee of this association, cause his successor in the milling business to be substituted in his membership herein.

10. No member shall be hereafter admitted into this association, except as provided in the last preceding section, without paying in the full amount of all assessments theretofore paid by the then existing members, including the amounts paid by the members of the State Millers' Association, as heretofore organized.

Provided, That all mills which have been running only since the 1st of January, 1879, may be admitted on application upon payment of $25 per run, and mills which may hereafter be built shall be admitted, provided they make application for such admission within three months after they shall have been put in operation, and no assessment shall be made against them for the current year of their admission to membership in the association.

OTHER MATTERS.

It was ordered that the Secretary send to each member of the association the articles agreed upon, together with the report of the meeting, with request that they sign the same or give him power to enroll them as members of the association.

The President was authorized to appoint a committee to draft by-laws for the government of the association.

The names of the present officers were read, and Mr. Fletcher moved that the Secretary be authorized to cast the vote of the association for the present officers, to be the officers for another year.

Mr. J. A. Christian desired to be relieved from the duties of chairman of the executive committee, but the members would not accept.

Mr. Cahill raised the point that the association could not elect officers because there were no members of the association until the articles of agreement were signed.

The point was ruled not to be well taken and the officers were re-elected with the proviso that the first three members of the old executive committee be the members of the executive committee for the ensuing year. The officers are as follows: President, W. P. Brown, Red Wing; Vice President, C. A. White, Hokah; Secretary, F. B. Mills, Minneapolis; treasurer, J. A. Christian, Minneapolis. Executive committee—J. A. Christian, Minneapolis; E. L. Baker, Red Wing; W. H. Dunwoody, Minneapolis.

The President was made *ex-officio* a member of the executive committee.

The Secretary was allowed $300 for his services during the past year, and the executive committee were authorized to fix his compensation in the future.

The President was authorized to appoint a delegation of five to attend the National Convention which convenes in Chicago on the 13th of May.

The association at 2 o'clock adjourned to take dinner in a body at the Nicollet upon the invitation of the Minneapolis millers.

After two hours to food for mind and body the gentlemen rose and adjourned to the parlors where they were again called to order for business.

COMMITTEE ON BY-LAWS.

The President appointed the following committee to draft by-laws: F. S. Hinkle, L. Fletcher, C. T. Hobart.

DELEGATES TO THE NATIONAL CONVENTION.

The President appointed as delegates to the National Convention, which meets at Chicago on the 13th of May, the following gentlemen: J. A. Christian, E. L. Baker, L. Fletcher, T. C. McClure, D. Bronson.

Mr. Fletcher, on behalf of the Millers' Association of Minnesota, offered the following, which was adopted by a rising vote:

WHEREAS, This convention has learned with indignation of the disgraceful action of certain members of the Missouri association during the hearing of the Cochrane suits at St. Louis; therefore,

Resolved, That the conduct of those parties in thus surrendering on the threshold of victory, and at a time when they must have supposed that such action on their part would prejudice the Court and jeopardize the interest of their associates, deserves and should receive the condemnation of the entire milling fraternity throughout the country.

Resolved, That the hearty thanks of this association are due to Gov. C. C. Washburn and J. A. Christian & Co., for the firm, unyielding and gallant fight which they have made, not only in our behalf, but that of the entire flour manufacturing industry of the country.

Mr. Fletcher moved a vote of sincere thanks of the association to the attorneys for the able and efficient manner in which they have conducted the suits, for this association and for the National association. The motion was adopted by a unanimous rising vote.

Mr. J. A. Christian spoke in commendation of the success of Messrs. Alex. Smith, J. A. Hinds and S. H. Seamans, his associates on the executive committee, in the prosecution of the suit. Mr. Smith, he said, had done the hard work of the committee and of the association, and he thought it due to him that the association should pass a vote of special thanks to him for his ability, energy and enthusiasm in the matter. He therefore

Moved, That the Minnesota State Millers' Association tender their thanks to Mr. Alexander H. Smith for his services in the Cochrane patent cases, and for his efforts to se-

cure a strong legal organization, State and National.

Mr. D. Syme suggested that Mr. Seamans be included in the resolution, but other members, while admitting Mr. Seamans' ability, said he had not had the opportunity to do the hard work which devolved upon Mr. Smith, and therefore the exclusive vote of thanks to the last named gentleman. While there was no intention to reflect on other members of the committee, it was deemed right and proper that a vote of thanks be given Mr. Smith for the extent and value of his services.

THE MEMBERS.

Before the adjournment, which was effected about five o'clock Tuesday evening, April 8th, the following firms had signed the articles of agreement published above:

Gardner & Mairs, Hastings; Washburn, Crosby, & Co., W. H. Hinkle & Co., G. W. Goodrich & Co., S. S. Brown & Co., Hobart, Shuler & Co., Pratt & Baird, Crocker, Fisk & Co., D. R. Barber & Son, Minneapolis, Minn.; Walcott Mill Company, Northfield; Mazeppa Mill Company, Mazeppa; Foss, Wells & Co., Jordan; Townsend & Proctor, Stillwater; Mills & Houlton, Elk River; Kimball & Beedy Forest City; LaGrange Mill Company, Red Wing; Croswell & Syme, Long Lake; Eagle & Co., Austin, Minn.; White Bros., Hokah; Miller & Ellsworth, Minnesota City; Cannon River Manufacturing Company, Faribault; Sackett & Fay, St. Peter; Geo. F. Strait & Co., Shakopee; B. D. Sprague, Rushford; White & Beynon, Lanesboro; White, Nash & Co., Lanesboro; White, Beynon & Co., Medford; Benjamin Taylor, Red Wing; Red Wing Mill Company, Red Wing; W. H. Officer, Austin.

A number of the millers had left for home by early trains before the articles were ready for signature. Therefore the meagre representation thus far. The Secretary will send the articles to all the millers in the State for signature, and the organization in all probability will start out with a full representation of the six hundred run in the State.

THE FLOUR INDUSTRY IN BUDAPEST, HUNGARY.

[Translated from the Pester-Lloyd Journal for the UNITED STATES MILLER.]

In regard to the technicalities of milling we will mention first of all that in the course of the past year a safe and well established method of constructing the frames of rollers has become established, tried and approved by practice and reduced to a systematic mode of operation.

The occurrence of smut and blast in this year's wheat more than ever required a radical improvement of the mechanism of machines for cleaning it. The great majority of the mills of Budapest and the provinces felt induced to reconstruct their apparatus for cleaning the grain. An unavoidable series of the different operations necessary for cleaning the wheat was universally adopted. The grain-cleaning machines with ventilation, introduced by Adolph Fischer, met with the most satisfactory results. By this machine the dust when once loosened by powerful friction is, as may well be conceived, carried away directly by the current of air, until the wheat is clean and free from dust. The machines formerly used did indeed partially loosen the dust, but did not immediately remove it, and as a result of this it adhered to the wheat again to a great extent and soiled it anew, so that in running out of the machine only the dust that had accidentally remained loose could be separated from the wheat.

The points of sprouts and barb in wheat were apparently well removed with the old machines by means of tin graters, sawblades, stones, etc., but the husk of the kernel was scratched, damaged and soiled by the dust. The wheat cleaned by the older machines showed a dark color while wheat cleaned by means of the most modern machines, is marked by a bright color, and consequently furnishes pure and whiter coarse meals. The use of rollers has been more extensively introduced. Rough-grinding is done to-day exclusively by furrowed (fluted) hard-cast rollers with differential velocity, provided according to the kind of work with finer or coarser furrows. The so-called cutting-machines are disappearing gradually; it appears that the troublesome repairing of them and the interruption thereby occasioned, as well as the reduced value of the cut-up bran are driving them out of use. The grinding of the groats (coarse middlings) are done partly by furrowed, but mostly still by the smooth, hard-cast rollers; the grinding of the fine middlings by smooth, hard-cast rollers with a slight differential velocity. The rollers for the latter operations have been essentially improved by Mechwart, manager of Ganz' Mill Building Works, by means of a construction which enables considerable saving of power, and makes a pressure of the rollers practicable of a degree heretofore inadmisible. Experience has taught that it is most advantageous to let the groats pass through the rollers only once, the fine middlings twice, however, before being subjected to a bolting process. In bolting the groats that have passed through the rollers, only a small quantity of inferior flour is separated, the fine middlings, however, will then furnish from 50 to 75 per cent of the very best flour. The springs of these rollers for grinding (construction by Mechwart) which cause the pressure have stood the test perfectly in regard to durability as well as to efficiency.

The grinding out of the finest dust and of the bran is done by means of stones, which in mills of this country also have been provided lately with ventilation, so as to prevent the hot-grinding and the injurious formation of paste in the cylinders, etc.

The centrifugal bolting machines are gradually being introduced, but mostly in mills where the reels have to be put up in a limited space, but also where on account of want of room a separate detacher for the roller apparatus cannot be used. The consumption of bolting cloth for the covering of bolting machines is pretty nearly equal to that of reels of ordinary construction.

The middlings purifying machines of Charles Haggenmacher still maintain their superiority and are in use in all establishments of Budapest and of the province, and the demand for them from foreign millers is greater than ever.

We can thus state with satisfaction that the Hungarian process of milling has reached a degree of perfection heretofore unheard of, and the impulse given by millers of this country has carried its influence over the whole continent and Great Britain; yes, that even in transatlantic countries the attention of millers has been called to the Hungarian process of milling and that they sent numerous representatives here to study it. Next to this pleasing fact we can also state that the merits of our machine building are already acknowledged in large circles in foreign countries, and we owe to them quite an extensive export of milling machinery.

Germany, Switzerland, Russia and England have become important and regular buyers of Hungarian rollers of Ganz & Co., and even for America orders were effected in the course of the last year.

It has become the conviction that in milling the introduction of the use of rollers especially is no longer an experiment but has become a necessity. It is, perhaps, saying too much to ascribe the brilliant success of our mills in the last four years exclusively to this new method of grinding, but it is nevertheless a fact worthy of consideration that the milling business in all countries where the innovation has not yet spread, or only to a very little extent, is constantly in a languid state, while it is just the introduction of the system of grinding with rollers that coincides with the immense success of our steam-mill establishment.

The annual grain-market in this city has this year been even less attended than in the preceding years, and the institution is still in a languishing state without coming to an end.

The millers' day connected therewith had no special subjects for deliberation and the management of the connection and communication between the several mills was left to its standing committees.

In the price of coal and insurance, and in the relation with laborers, no important changes have taken place, and especially in regard to the latter subject we can point with satisfaction to the fact that contrary to Germany, no socialistic tendency or agitation has shown itself among our laborers.

As a consequence of the brilliant results obtained in the last few years a decided change in the public opinion has taken place, and to the pessimism of the period after the great commercial crisis a boundless optimism has followed, and in consequence enlargements of establishments as well as the erection of new mills are again planned. But here cool reflection should exert its influence and the experiences of the previous period of stagnation and hard times should serve as a lesson how fickle and changeable the opinion about the value of mill-shares is, and it should be considered especially that an extension of the milling business, as long as the means of keeping a large supply of cereals in the place are not furnished us by entrepots (grain-warehouses), may bring dangerous, sudden increase in the price of the grain not warranted by circumstances in general, so that when these new establishments are really built, the fact should serve as a further stimulus for the realization of the so long and so fruitlessly agitated project of "entrepots" (grain-warehouses.)

The pension-fund for mill-employes which had long been talked of has at length been sanctioned in principle, and after the perfection of mathematical details of the project which are just now under consideration, it will become an established fact, so that the future of the mill-employes is just as well secured as the domestic industry of milling itself has Phœnix-like arisen from the general decline of industry and become sound, and in consequence of the last successful years so well provided with reserves, that it as well as its stock-holders may look forward to the natural and doubtless by occasionally re-occurring periods of stagnation with calmness, the more so since to the safe financial situation and the experienced corps of employes, an able management is joined by men tried in the school of misfortunes and influenced neither by pessimism nor by optimism.

OUR PENNSYLVANIA LETTER.

[From our special correspondent.]

PHILADELPHIA, Pa., April 12, 1879.—The opposition to the Cochrane patent claim, which has become so united and manifest among the millers and flour operators of the Western States, has spread to the flour milling fraternity of the East, and the expressions of sympathy with and support to the opponents of the claim are decidedly great upon the part of the millers and various State associations. The magnitude of the interest at stake is fully recognized by all who use mill machinery, and this is the chief reason why there is so much opposition to the unscrupulous scheme and its originators.

The prominent flour manufacturers of Pennsylvania are particularly up in arms against the patent claims, and, to assist in the battle against the would-be monopolists, the State Millers' Association, through the Secretary, A. Z. Schoch, has subscribed $150, and P. A. & S. Small, of York, have added $500 more, to push the war against the patent right monopolists, and to secure membership in the Millers' National Association. The milling fraternity is almost a unit for a vigorous fight against the movement inaugurated by the Cochrane people, and the intelligence comes from all parts of the East of organized and powerful opposition to them and their claims, which are considered to be illegal in every respect.

The flour interest of Pennsylvania, New York, New Jersey, and other Eastern States, appears to be enjoying its usual prosperity. The merchant millers are still vigorously competing in a friendly spirit for the export trade, and several prominent flouring establishments have sent large consignments to European and South American ports within the past few weeks. The Messrs. Small, the great representative flour manufacturers of York, York county, this State, have been, for some time past, shipping vast quantities of their excellent made flour to South America via lines of steamships and sailing vessels from Baltimore, Md. The article manufactured and exported by the Messrs. Small stands A No. 1 in the South American markets.

Philadelphia millers all report excellent transactions this season, so far, and now that the season's trade has fairly opened, the fraternity look forward to a still greater activity in their business, although, of course, with corresponding profits. The old-established firms of Morgan & Alley, Germantown road and Second street, and E. H. Graham & Co. (Progress Steam Flour Mills), 2,136 Market street, report the trade to be in a reasonably fair condition, and say that the situation must improve as the season advances.

The exportation of unmanufactured breadstuffs from this port, while now being very large, is steadily on the increase. The elevators of the Pennsylvania Railroad and Philadelphia and Reading Railroad Companies are kept busily running day and night in loading the steamships destined to foreign places. The latter company have, within the past few days, been doing an extraordinary business in shipping grain, which fully illustrates to what a remarkable extent the staple commodity of America is used in European countries.

Thinking that the grain shipping operations may not prove uninteresting reading to your patrons, the UNITED STATES MILLER correspondent has visited Port Richmond, the centre of the business of the Philadelphia and Reading Railroad Company, to obtain the facts relative to the grain movement. Midway of the company's coal wharves, where 100,000 tons of "black diamonds" are lying, are two piers, designated as No. 13 north and No. 13 south, entirely devoted to the shipments of grain. They have a capacity of 80,000 bushels a day, and at times they are employed to their fullest capacity, working day and night.

Immense consignments of the various cereals are coming in from the Western States, the bulk of which finds a quick and immediate market in European countries. As an old Pennsylvania grain-grower very truthfully says: "We Americans feed not only the natives of this country, but just about one-half of the people on the other side of the ocean," and no one is more willing to reiterate this statement than yours truly,

THE DUSTY MILLER.

IS POOR WHEAT GOOD FOR SEED?

The above is a question that comes from nearly every quarter of the State. I will answer the question by giving a few kinds of seed wheat and results, and you can draw your own conclusions. Seed wheat should be classed the same as wheat is graded—No. 1 and so on. No. 1 seed is a variety of wheat that is pure, free from all foul seed, cut before it is shattered any, well cured, stacked or put under cover without rain; threshed with a flail or tramped out with horses on a threshing floor; cleaned twice with a fanning mill, the last time with a coarse screen that will let through all the small and medium sized wheat; the balance of the wheat will be strictly No. 1 seed wheat; will never deteriorate or run out as long as it is kept up to the high standard described; and in the hands of industrious farmers can be improved in quality of wheat and yield per acre. With such wheat, half the usual amount per acre will be sufficient.

No. 2 seed is such as has been usually sown in this State since its first settlement, just as it came from the machine, with the exception of once cleaning, and then sown in quantities per acre, in proportion to the quality of the seed. I have repeatedly examined this class of wheat with a magnifying glass, and invariably found the largest and best wheat broken, cracked or injured from threshing, and would not grow; and also a portion of the medium sized wheat, while the small wheat was seldom injured. This class of wheat can never produce a full crop of wheat. A field of wheat from this class of seed, when ripe, will represent the kind of seed sown better than words can express. A small portion of the standing grain will be of good height, large heads, and well filled with large kernels, provided the season is good. The balance of the standing grain will present every height, from six inches up to within a few inches from the tallest; the heads, quantity and size of wheat corresponding with the stock on which it grew. In wheat of this kind there is a loss of yield per acre, a loss in paying threshing bill, a loss in grade when sold, and if not bought very low, a loss to the mill that grinds it.

No. 3 seed is wheat that has been killed with the rust. If secured without rain and well screened, it usually makes better seed than No. 2.

No. 4 seed is wheat badly bleached, repeatedly wet and dried, or threshed wet. Such wheat will often grow, but is very weak and should not be sown.

A large portion of wheat grown in this and adjoining States last season, will not grow; nevertheless there is in nearly every bushel from five quarts to a half bushel of No. 2 seed, and will make about as good seed as has usually been sown; should be separated as much as possible from the poor wheat, as much of this will grow, but can never make wheat that will be worth cutting, and will only burden the ground to the detriment of the good wheat. I know there are many that will say it is all bosh to be so very particular about seed. They will tell you they have raised from 25 to 30 bushels per acre with poor seed. If good seed had been sown they would probably have got 35 or 40 bushels per acre.—*Correspondence Minneapolis Tribune.*

There are ten girls in a Pennsylvania millers family whose "Christian" names are these: Emma Angelina Adlet, Lovinia Serena Cornelia, Alice Ellen Amanda, Torvilla Susanna Corilla, Francina Telara Cencillia, Perlinia, Sibylla Agnes, Christiana Effibulia Eliza, Annie Olivia Virginia, Ida Cora Jorine, and Mary Ann Alecia.

THE COCHRANE PATENT.

Highly Interesting Review of the True Inwardness of the Great Suit.

How the Supreme Court Came to Allow the Original Case to Slip Through.

The Points of the Recent Decision and the Probable Feature of the Case.

THE BOTTOM FACTS, AS RELATED BY "GATH" FOR THE CINCINNATI ENQUIRER.

You have probably not seen a clear account of the great upsetting just given by George Harding to the great milling monopoly, with its headquarters in Ohio and the District of Columbia. This came off in the Circuit Court of the United States west of the Mississippi river, and the decision was only given March 17th. The monopoly took the name of "The American Middlings Purifier Company," and had sued John A. Christian, of Minnesota, and the Atlantic Middling Company, of St. Louis, for alleged infringement of patent. The infringement essentially consisted in atmospheric bolting of flour middlings. I despair of making this plain to you, except in the way of conversation. Let me put to the lawyer, therefore, some questions.

"What is a grain of wheat?"

"A grain of wheat is a berry with a soft floury mass in the center and harder coatings. The center gives fifty per cent of the superfine flour, and is divided into numerous cells, divided by gluten, starch and cementing matter. The problem of grinding consists in separating the interior mass from the coatings, which constitute the bran, and pulverizing it. The hull ought to be pulverized as little as possible, while the interior mass is well pulverized, because when you come to bolt the flour you want the bran to be in larger particles and not to go through the cloth. Now, winter wheat, which has a rough wooden husk, is easily separated; but the spring wheat further north has a brittle hull, which pulverizes almost like the flour itself. Consequently, the Minnesota flour was specked, while the St. Louis grain ground much better and the flour brought a higher price. The present law-suit arose from the introduction of French machines into Minnesota by which they reground the middlings and produced even a better article than St. Louis.

"How do you define middlings?"

"Our definition in that respect came down from Oliver Evans, who ground flour on the Brandywine fifty years ago, and wrote about it. After your flour has gone through the mill-stones, you want to sift it (or *bolt* it), which is done by a bolting cloth attached to a reel; the cloth has a progressively coarser mesh, and the *meal* or coarse-ground wheat, lying on the cloth, sends the finest flour through the top, and as the flour mass goes onward, it drops coarser; the coarse part is again taken up to the head of the cloth and sent onward a second time. Now, there is something left after this double bolting, and it retains the name of *meal*. The finest of this meal is called 'middlings'; the next coarser quality is called 'shipstuff,' and the third quality is called 'shorts' and 'bran.' Now, you must see, that as machinery advanced and our wheat increased in quantity, it became desirable to hasten the old fashioned slow *bolting* operation. It was generally believed that atmospheric pressure would do it. The Americans and the French both set to work at this.

AMERICANS AT STEAM-BOLTING.

"Which was the American patent that drew most attention?"

"It was called the Cogswell & McKiernan patent, and was granted June 12, 1860. A blast of air was introduced into a hollow shaft surrounded by a zinc box perforated with small holes. The air escaping went up a crooked chimney, whose elbows formed eddies and let the flour fall back into the reel-chest. This patent was sold to William F. Cochrane, and in the summer of 1861 he put up a mill on that patent near Springfield, Ohio, for the Warder family. Some trouble occurred, and after many improvements and corrections the whole thing was laid aside, somewhere about 1863. It died right there and for ten years not a 'ghost of it lingered around. Yet that patent became the basis of the greatest milling business of our times."

"How was that?"

"It was accomplished through the surrender and reissue of the patent, taking advantage of the Patent Office at Washington. This was not done until the French machines had revolutionized wheat grinding in Minnesota. About 1860 they introduced spring wheat into Minnesota, and the crop increased rapidly, until it was nearly 3,000,000 bushels in 1863, and more than 33,000,000 bushels in 1877. Yet the brittle hull of the Minnesota wheat would get into the flour and could not be bolted out by the old process. Consequently, though richer in gluten than the St. Louis flour, it held an inferior place in the market, and was used by bakers only, not by families. In that condition of things a Frenchman named Le Croix, who knew about the system of grinding spring wheat in France, told his neighbors, the great millers around Minneapolis, to try the French machines. Consequently, Mr. George H. Christian sent out to France and imported what is called the Cabanese machines, first patented in April, 1856. After about one year's experiments with these machines in his mill and constructing others like them, Mr. Christian fully established the character of Minnesota flour in 1871. It was done by what is called the middlings purifying process. It brought from one to two dollars more in the Eastern markets, and one dollar a barrel more than the St. Louis flour. The effect was immense, when it suddenly occurred to some sharp fellows that the old Cogswell & Cochrane patent should be revived and a good thing made of it."

SETTING UP A PATENT JOB.

"Who were the persons interested in this performance?"

"Mr. William Warder and Mr. Rodney Mason, in 1873 and 1874, entered into an understanding to obtain the greater part of the interest in the old Cochrane patent, and then reissue it so as to cover the new process. Middlings had never been ground into superfine flour here. Cochrane readily agreed to give one-half his interest to Mason—which was one-fourth of the entire patent—for obtaining the reissue and prosecuting suits under the reissue. The thing was then so worthless that William Warder had got a fourth of it for nothing. These three men—Cochrane, Mason and Warder—slipped off to Washington city, and associated with them three lawyers—Peck, Phillips and Walter Cox—and two men of means—John O. Evans and J. Van Buskirk. These latter persons furnished $6,000 to carry on the litigation. The patentees at once brought suit against a miller at Georgetown, D. C., under their new patent. The miller, Welch, had been the first to tell them that purified middlings could be manufactured, and he is suspected of being in with them. Their suit was pressed, and before it was decided the interested parties resolved to carry it right up to the Supreme Court on printed briefs. They got a verdict in their favor."

"How did they get a verdict?"

"By an *ex parte* affidavit of the first inventor, Cogswell, he testifying that Cochrane was the real inventor of the air-blast and ventilator. The Supreme Court thus misled, decided that the old Cogswell & McKiernan patent did not interfere with Cochrane's reissue. They also seemed to establish the fact that this Cochrane invention antedated this French patent. The fact is, that on both points the Court was misled."

"Well, what next?"

"The owners of the reissued patent not only collected their royalties with impunity all over the country, but went back for years and demanded payment for whatever flour had been ground by the middlings purifying system. Now, the French invention was an entirely different thing. It was a vibrating sieve, inclined, and as it rose and fell at the sides produced a current of air which passed upward through the meshes of the sieve. The French had used this vibrating hand-sieve for a long time, but Cabanese put machinery to it. The St. Louis millers no sooner saw the Minnesota wheat excelling theirs than they made improvements. They adopted the French system of putting their millstones further apart so as not to crush so much of the husk nor kill the life of the flour. They also developed the glutinous properties of their own flour by a successive grinding, modifying the faces of the millstones and reducing their speed. Consequently, their re-ground middlings produced better flour than they had ever had."

TINKERING UP A TUMBLE.

"Did the American patentees make any changes in their apparatus to meet the description of the Cabanese machinery?"

"They tried to reconstruct it in the summer of 1877, and had some of the features of the French invention, but it was of no account. The additions they put on bore no reference to their reissued patent. Indeed, the American inventors and millers knew nothing whatever about regrinding and rebolting their middlings."

"The counsel who argued this case introduced before the Court working models not only of the Cabanese machines and the Cochrane machine, but also of the Gove Farina machine. He made the whole process clear as day to the Court, and so annoyed the opposing counsel that he referred to the fact that a set of banded robbers had grouped together to fight a poor inventor! Harding replied that the opposite counsel had availed himself of their working models, and that not a cent had been spent except to get up the exhibits, diagrams and models."

TRACING OF A MECHANICAL SNAKE.

"Did he argue the point about the invalidity of reissue?"

"Very ably; he showed that by the act of 1870 the introduction of new matter is expressly forbidden in the issue, and altering the drawings annexed to an original patent is also expressly forbidden. Both these provisions were violated. Parts of the original patent by Cochrane were omitted. He first claimed that the bolting was only aided by a strong blast. In the next patent he speaks of the process of purification as wholly independent of any blast operation. He adds the words: 'Reducing the meal by subjection to the combined operations of screening and blowing, and afterward regrinding and bolting and purified middlings.' He never knew anything about middlings before. Mr. Harding also took up the confusion of terms as to middlings, meal, bran, etc., produced by the corresponding terms in France, which led to a close overhauling of the dictionary. Old Oliver Evans reappeared from the grave to verify the advocate. He showed that such reissued patents, when amended, had been set aside in such prominent cases as the Fiber Disintegrating Company, the Hat Body patent and Sat Liquor patent. In the case of the Giant Powder Company, the Supreme Court ruled that the abuse to be provided against was the temptation to amend a patent so as to cover improvements which might have been invented by others after its issue. The damages claimed from the millers were so immense that the conspirators proposed voluntarily and cheekily to limit them by compromise or even by special law."

Mr. Harding closed his argument with the following words: "Can a man give such a patent to the public as Cochrane did in patent 37,317, and then reissue it in the new form in which it is reissued in 5,841, and hold the whole milling trade of this country subject to it? If that can be done, it *may* be right, and if your honors say so it *will* be right. But, may it please your honors, many, many will think it hardly in accordance with the advance of civilization and progress of laws in this, this last quarter of the nineteenth century."

OBTUSENESS OF THE SUPREME COURT.

"How did the Supreme Court allow such a case to slip through?"

"It was very shrewdly worked. Such lawyers as Walter Cox, now a Judge of the Federal District Court, and the son of ex-Judge Peck, of the Court of Claims, and Rodney Mason, a patent lawyer, the son of General Mason, of Springfield, were let into the patent, expecting that they would socially influence the Court. It is also believed that the case against the Georgetown millers was got up and poorly defended on purpose by an obscure lawyer named Cady. In short, the Supreme Court now knows that this patent was reissued and test case made in order to get their instant favorable decision."

"What way had the Supreme Court of correcting such an error as that?"

"As soon as their attention was fully brought to the case by the public indignation and by the lawyers, they granted a 'commission,' which they seldom do, and never like to do, empowering any Circuit Judge to try another case of the same kind, and then let an appeal come up to them *de novo*, that is, as if there had not been a previous trial."

"The happy patentees then set to work to get money out of the big mill of Washburn & Christian. They admit having obtained $60,000 in all as compromised royalties from the millers, with which they conducted the litigation. They came from Minneapolis down to St. Louis and struck the millers there. Mr. E. O. Stanard, formerly a member of Congress, and a big miller, was weak enough to pay them, notwithstanding the general agreement of the St. Louis millers to resist. He was expelled from the millers' association. The case was then brought to trial on behalf of both the Minneapolis and St. Louis millers before Judge Dillon, sitting on the bench, with associates Nelson and Treat, at St. Louis. George Harding, who probably got an immense fee, went into Court, as I have said, with his working models, exhibited large diagrams, baked bread in the presence of the Court, and made this matter as plain as day."

FUTURE OF THE CASE.

"Is it to be tried again?"

"The Cochrane patentees say that they mean to carry it up to the Supreme Court; that their only weak point is about the reissue of the patent, and that they will have stronger counsel than before. You can imagine how much the millers have saved when you conceive the enormous number of barrels of flour ground in this country and the infinite mass of middlings, hitherto refused and used for horse-feed, which, by the amended methods, become superfine flour."

"What were the points of the decision?"

"All the Judges concurred. Judge Dillon boiled his conclusions down in these words: 'The idea of Mr. Cochrane was the use of the blast in the reels as an aid in the mere process of bolting, with the view of obtaining an increased quantity of choice flour, and not for the production of purified middlings. The reissued patent having been expanded to embrace a claim for purifying middlings, when no such process was described, suggested or claimed in the original patent, is void."

Judge Nelson expressed the same idea in these words: "The actual invention of Cochrane has been enlarged by the addition of new matter in the reissue, so that when the two patents are compared, the extension is apparent. This new patent is not for the same invention secured and embraced in the original letters patent."

Judge Treat at length discussed the two methods and said of the case already decided against Welch by the Supreme Court, "If an appeal is taken that Court will have before it in this suit the large amount of new evidence introduced; in the light of which it can determine for itself whether it will review its former opinion or not."

GATH.

AUSTRALIAN WHEAT STACKS AT CALTOWIE.

Since the large extension of agricultural operations in South Australia, by the opening up of the Northern Areas, a new feature has appeared in those settlements—immense stacks of bags of wheat awaiting transport to a market. Reference is made to such stacks in Harcus' Book, and an engraving is given of a very large one at Messrs. Duffield & Co.'s mill at Gawler. A similar one has been built at Messrs. Siekmann & Moule's Caltowie wheat store. This little township has, from the first settlement of the farmers in the surrounding districts, been one of the most important centres of the wheat trade. Messrs. Siekmann & Moule opened a branch of their business in Caltowie at an early period in its history, about the year 1873, and have purchased immense quantities of grain from the farmers, to whom they offered great facilities for its conversion. The past season has been a very busy one in this township; the crops in the neighboring hundreds of Belalie, Mananarie, Black Rock, and Yongala having been rather above the average. Most of the produce found its way to Caltowie. All the principal firms in the wheat trade were there represented, but we are creditably informed that Messrs. Siekmann & Moule did the lion's share of the business. This was, we believe, owing to the great popularity of the firm amongst the northern farmers, many of whom had been assisted and befriended by them. This firm, whose central establishment was at Saddleworth, had wheat agencies also established at Crystal Brook, Gladstone, Jamestown, Tarcowie, Yatina, Yarcowie, Farrel's Flat and Manoora, and probably a million bushels of wheat altogether passed through their hands in the season. Owing to the deficient means afforded by the railway for carrying away the produce, large quantities accumulated along the line, and Messrs. Siekmann & Moule, after availing themselves of every inch of ground allotted to them at the railway station, were compelled to build several large stacks of bagged wheat on their own premises, about 200 yards from the line. Their celebrated stack of 35,000 bags attracted the attention of His Excellency, Sir W. Jervois, when he visited Caltowie. The removal of another large stack has been nearly completed, Messrs. Seikmann & Moule having gone to the expense of having a line of rails laid for 23 chains from the railway station to the stack to facilitate its removal.—*Adelaide News, Australia.*

Elihu Burritt, of New Britain, Conn., commonly known as the "Learned Blacksmith," is dead.

REPORT OF BUSINESS IN THE MILLS IN HUNGARY.

[Translated from the Oesterreichisch-Ungarische Mueller for April for the United States Miller.]

The annual meeting of the five mill-associations in Hungary was held last month, and from the reports submitted, we clip the following concerning the status of the same:

I. The "Pest Millers' and Bakers' Association." The board of directors say in their report: The mills were only 237 days in operation during which time 228,053.23 kilograms* of wheat and 4,576.18 kgr. of corn, altogether 232,629.41 kgr. of grain, were ground, producing 225,808.12 kgr. different mill products. The profit thereof amounted to 134,187.47 florins†, and adding to this amount the net balance of the year 1877, 175,107 florins, it will make a total net income of 135,938.54 florins. The board of directors moved to distribute of this amount 135,000 florins as a dividend, so that the 10th coupon, due on June, 1, 1879, could be redeemed on April 1, for 45 florins, and the balance of 938.54 florins be credited to the profit account for the year 1879. The board of directors, taking in due consideration that the production is insufficient, although the mill was running without interruption and there being only one steam mill, stoppages are unavoidable—therefore recommend the erection of a second mill, according to the rules of the association. The cost of erection of this mill, including all machinery and water supply for two boilers will be about 50,000 florins, and the board of directors recommend the issue of 2,000 shares of 900 florins each, of which number only 1;500 should be issued at present. The preference of the purchase of the new shares is reserved to the holder of the old ones to such an extent that the proprietor of two old ones is only entitled to acquire one of the new issue. The last 500 shares would only be sold if necessity should demand it, in which case the board of directors would like to be empowered to sell them for the benefit of the association. The five installments of 40 florins each, must be paid between April 1st and August 1st, and the right to preference expires on April 14th. In case the erection of the mill should require more capital as calculation is made on, the amount necessary shall be taken from the cash on hand. After discussing the report and reviewing the balance sheet, the meeting approved of the proposed dividend, and also voted for the erection of the new mill according to the plans, etc., submitted by the board of directors.

II. The "Concordia Steam Mill Association, of Budapest." A synopsis of the report of the board of directors shows that like in 1877, in the following year, the fore part especially, the financial and political prospects were so uncertain that the greatest discretion and caution was necessary. As it was unavoidable to adopt the latest technical inventions in our line of business, we were compelled to remodel our mills to a great extent, and to rebuild almost entirely our grist-mills. On this account we could only work to our fullest extent during the latter part of the year, and the 513,632 mtzgr. (about 898,856 bushels) of wheat ground, resulted in 496,253 mtzgr. (864,442 bushels) of mill products.

We realized, as will be shown by the balance sheet, 803,821.39 florins. We move to deduct therefrom 136,500 florins for wear and tear of the buildings, machinery, implements, duplicate parts of them and outstanding accounts, and the remaining 167,321.29 florins should be divided and expended as follows: Three per cent or 5,019.63 florins to the credit of the reserve fund; 10 per cent or 16,732.13 florins for salary of the board of directors and committee of inspection; 4 per cent or 6,692.85 florins for salary of the general manager and other officers; dividend for 2,300 shares at 60 florins per share, 138,000 florins; total, 166,444.61 florins. The surplus, 876.78 florins, and the balance of profit from the year 1877, 2,877.13 florins, total 3,253.91 florins, should be credited to the new profit and loss account. The dividend will be paid on and after April 1st.

III. The "Elizabeth Steam Mill Association at Budapest." The board of directors say in their report: During last year 290,732 mtzgr. of wheat was ground, being 82,287 mtzgr. more than in the year 1877. The net profit, as shown by the balance sheet and approved of by the committee on inspection, amounts to 138,948.28 florins after deducting all expenses. The board of directors recommended that instead of the usual 5 per cent, 20,841.48 florins or 15 per cent be added to the reserve fund, and 16 per cent or 22,230.88 florins be paid for salary for the board of directors and other officers; adding to the balance of 95,870.92 florins the surplus for the year 1877, or 2,597.43 florins, the total amount of net profits is increased to 98,468.35 florins. Of this sum 90,000 florins should be paid out as dividends, and the balance, 8,468.35 florins should be credited to the profit and loss account. This will increase the reserve fund to 107,435.70 florins, and the dividend for each share, 30 florins, will be paid on and after April 1st.

IV. The "The Pesther Victoria Steam Mill Association at Budapest." The board of directors say in their report, after expressing congratulations to the society for the success and enormous profits realized during the last year: You are all well aware of the hardships our enterprise was subjected to and that our beginning was not successful in any way. Our business was declared a humbug, but how different is it to-day. The home steam mill industry has conquered all prejudices, her product is recognized as the best in the world and every Hungarian speaks with pride of his home mills, which are considered as examples for every mill in the world. 37,814,277 kgr. of wheat were ground and 36,678,851 kgr. of mill products obtained therefrom.

According to the accompanying balance sheet, the net profit for the year 1878 is 327,130.06 florins. This extraordinary gratifying result induces the board of directors to recommend that the reserve fund be again increased to a considerable amount, so that our enterprise is secured against misfortunes unforseen, which may befall the commercial world.

The board of directors recommend, therefore, that instead of the usual 5 per cent, 50,797.31 florins be added to the reserve fund, so that it is raised, according to § 58 of the Statutes, to the maximal sum of 200,000 florins; also that 50,000 florins be allowed and set aside for the creation of a special reserve fund, and 38,955.61 florins for salary of the board of directors and other officers, so that after deducting this whole amount from the net profit and adding to the latter the balance of the year 1877 or 3,019.71 florins, a dividend of 72 florins on each share of stock, or 16 florins to each preferred share, should be paid on and after April 1. The board of directors further recommend that from the balance, 7,096.85 florins, 1,000 florins be given to the benevolent fund, and 300 florins to the Budapest Academy of Commerce, and the balance, 5,796.85 florins, entered up as net profit for the year 1879.

The recommendations were accepted, and the purchase of a piece of land containing 15,120 square feet, adjoining the mill ground was approved.

V. The "First Open-Pest Steam Mill Association." Assets: Buildings and real estate, 635,831.78 florins; machinery, 355,932.40 florins; tools and implements, 26,054.37 florins; horses and wagons, 11,988.80 florins; bags, 58,457.17 florins; wheat on hand, 288,427.24 florins; flour, 435,836.40 florins; checks, 125 florins; notes, 70,014.64 florins; foreign exchanges, 822,556 florins; C. O. D. account, 10,725.37 florins; cash on hand, 10,764.03 florins; barrels, 735 florins; bolting cloth, 647.75 florins; insurance, 31,467.96 florins; expenses of different shops, 2,364.39 florins; coal, 660 florins; office expenses, 157.50 florins; expense of teaming, 2,781.01 florins; stock on hand, 14,191.78 florins; repairs of furniture, 101 florins; insurance of the mill at Ofen, 33,119.86 florins; current expenses, 280.88 florins; expenses of the different shops, 2,260.72 florins; stock on hand, 3,193.56 florins; fuel account, 174 florins; sundry debtors (current accounts, 505,884.80 florins, due from bankers 384,996.86 florins), 890,851.16 florins; total, 3,210,649.52 florins. Liabilities: Capital, 1,000,000 florins; preferred stock interest account, 58.13 florins; outstanding bills, loss account, 52,003.19 florins; reserve fund, 200,000 florins; dividend account, 935 florins; workingmens' benevolent account, 5,976.96 florins; workingmens' bond account, 138.55 florins; endorsements, 794,823.60 florins; dividend reserve account, 198,780.56 florins; sundry creditors, 917,488.12 florins; profit and loss account (balance January, 1878, 9,668.84 florins, net profit in the year 1878, 809,226.57 florins), 811,895.41 florins; total, 3,910,649.59 florins.

*1 kilogram equals 2.204 pounds.
†1 florin equals 2 marks, 1 mark equals 23 cents.

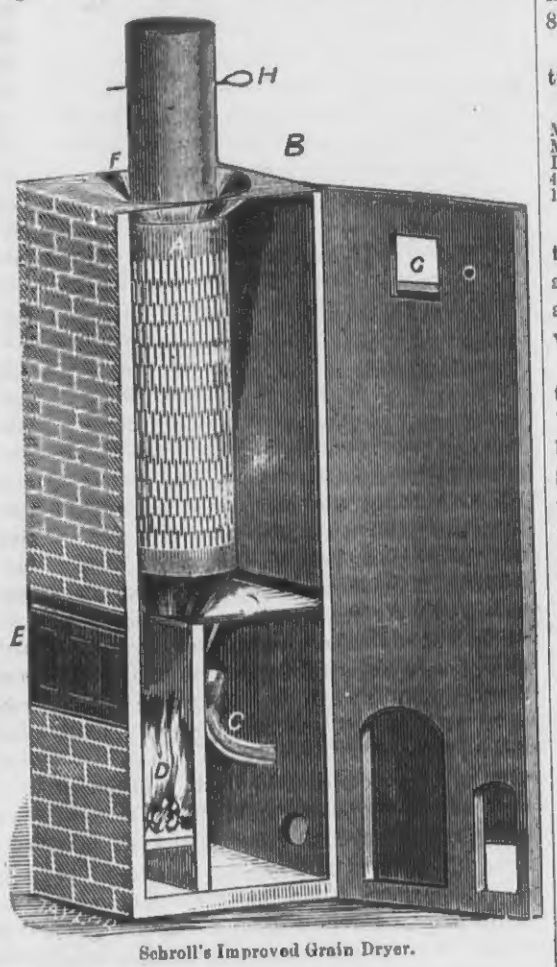
A NOVEL INVENTION.

Schroll's Improved Grain Dryer—Patented July 18, 1876.

This apparatus has a drying capacity of from 500 to 5,000 bushels per day, at an expense of one-half cent per bushel. It can be adjusted to dry the grain without damaging the germinating qualities of the same.

The construction of Schroll's improved grain dryer is consonant with natural principles. It is simple and durable, easy to control, and gives satisfaction in every respect.

The accompanying engraving shows an internal view, represented as if one side of the surrounding wall was suspended on hinges and thrown open. B is the upper plate, and F a funnel-shaped opening in the same, to the bottom of which is attached a perforated iron cylinder, A. This cylinder, A, has a conical bottom end, which empties into the discharge pipe, C, and to the upper part of which is arranged an annular valve with openings for regulating the discharge passage for the grain. A second perforated iron cylinder of reduced diameter is placed internally and concentrically within the cylinder, A, the upper end of which is connected to the smoke-stack, which carries off the gases and vapor. The space between both cylinders is continuously kept loaded with grain from above, which grain will be discharged from below proportionately to the openings by the adjustment of the annular valve, and the gases of an anthracite coal or coke fire will find an outlet only through the perforations in the cylinders and through the sheet of grain between both cylinders, whereby the moisture of the grain is evaporated.



Schroll's Improved Grain Dryer.

For grain to be ground in the mill, the annular valve is adjusted for a slow discharge, when the grain is retained in the apparatus for a longer period, and thereby made thoroughly dry, while grain to be used for planting is passed quicker through the apparatus.

Air-holes, E G, are arranged in the wall, which can be closed, and by means of which the degree of heat in the apparatus can be regulated by admitting more or less air.

This apparatus can be connected with an elevator for drying the grain before it is stored in the bins, and therefore it offers great advantages to brewers, maltsters, and millers.

The cost of drying grain in this apparatus does not amount to quite one-half a cent per bushel, and the grain is not damaged therein for seeding. It is also well adapted for the manufacture of oat-meal, and for drying shipping corn.

A Schroll dryer is erected in the mill of Messrs. Jiencke & Co., southwest corner of Kinzie and Green streets, in Chicago, where it can be seen in successful operation, and the above-named gentlemen will give any desired information regarding said apparatus, and will furnish samples of grain cured in the same to applicants from distant localities, by mail.

For further information apply to or address Carl Schroll, care of C. Schotte, 24 and 26 South Canal street, Chicago, Ill.

The residence of A. C. Pasfrey, miller, at Richland Centre, Wis., was badly damaged by fire April 17th.

THE SUPPLY OF BREADSTUFFS.

The rainfall in California during March has assured the wheat crop in that State, which though not the largest in its history, gives promise of being the best in respect to quality.

During the week ending March 21, two wheat laden ships sailed from ports of call in the United Kingdom for Havre, France.

The spring sowing of wheat in the United Kingdom has been completed, and it is now estimated that the breadth of land under wheat, fall and spring sowing, will be found to be 500,000 acres less than was planted last year.

From the 13th to the 19th of March there were 25 wheat laden ships passed the Dardanelles: Comprising 2 for the United Kingdom, 14 for Marseilles, 2 for other ports of France, 2 for Holland, 2 for Adriatic and the Mediterranean, 1 for Malta and 1 for Gibraltar.

The winter in the region round about the Azov Sea has been unusually mild, and navigation has opened a month earlier than usual; most of the ports being opened in March, when they have usually remained closed till after the middle of April. It is not expected that any large supply of wheat will be obtained from Azov during the remainder of the crop year.

The stock of wheat at Odessa the last of March was about 1,200,000 bus. vs. nearly 8,000,000 on Jan 1, 1879.

Wheat and flour on passage for the Continent:

	qrs. Wheat.	bbls. Flour.	qrs. Maize.
March 25, 1879	581,600	8,700	169,200
March 28, 1879	448,900	8,400	149,500

Including March 25, of wheat 365,000 qrs for France, 43,600 qrs for Belgium, 7,700 qrs for Holland and 14,700 qrs for Portugal.

The imports of wheat into France during the week ended March 28, including arrivals at Marseilles, Havre, Bordeaux and Nantes, aggregate 87,000 qrs, vs. 79,450 qrs the previous week.

The imports of wheat into Marseilles for the week ended March 22, '79, were 385,600 bus, and the stock in docks was 1,840,000 bus. There was a fairly active demand for Switzerland, although the milling inquiry was light, but was expected soon to show an improvement.

Advices from Calcutta under date of Feb. 28, '79, report nothing doing in wheat, with a probability that the wheat crop, so far as a surplus for export is concerned, will be a failure. The shipments from Calcutta for the United Kingdom from Jan. 1 to Feb. 26, 1879, had been 1,137 tons, vs. 7,708 tons for the corresponding period in 1878.

The exports of cereals from the North Russian Baltic ports of Riga for five years:

	1875. Qrs.	1876. Qrs.	1877. Qrs.	1878. Qrs.
Wheat	36,700	9,800	395,200	30,800
Oats	1,078,900	1,465,400	2,092,300	2,739,100
Rye	608,000	727,000	1,670,900	1,450,600
Total	1,723,600	2,202,700	4,164,400	4,220,500
Equal bus	13,778,800	17,621,600	33,[illegible]	[illegible]

Akherman is destitute of stocks and grain. At Nicopol there is barely 100,000 tschetwerts (600,000 bus). From the banks of the Dneiper no supplies of importance are expected till the incoming of the new crop, but on the other hand, large quantities may come forward from Besserabia and Podelia, provided there shall be no obstacles thrown in the way of rail transportation. On the whole, the estimate of the receipts at Odessa from reserves still back, and likely to arrive, of all the cereals is 1,800,000 qrs, equal to 14,400,000 bus.

The weather in Germany during the third week in March continued unfavorable for the growing winter wheat, caused by heavy snow and rain, followed by frost.

At Konigsberg, Germany, on the 18th ult., the weather was wintry, and the receipts of cereals small. There are twenty-five large steamers loading with grain at Pillau, mostly for the Continent, and their loading being completed, there will be very little stock left of grain. The reports at Konigsberg from the interior of Russia indicate that there are still good stocks of grain gathered there, but how much will come to Konigsberg for shipment is undetermined for the moment. Something will depend upon the corn duties that are threatened to be imposed by the German Parliament. Should duties be imposed it is expected that shipments of Russian grain will be made through Russian Baltic ports instead of Konigsberg, as has been the case for several years.

Kendall's grain warehouse and contents burned in St. Charles, Minn., April 8th. Will be rebuilt.

ROLLER MILLING *

This work, as the author tells us in his preface, was originally intended as an article for *Die Muehle*. It is in fact, as far as the subject is concerned, a reproduction of a lecture delivered by him some time since before the general assembly of the Society of Millers of Saxony, on the process of milling with rollers. When the author came to commit his lecture to paper, however, he found that he had not treated the subject so thoroughly as its importance demanded, and in the process of elaboration, finding that the work had grown upon his hands to an extent which rendered it unsuited to the columns of a newspsper, he at length determined that it should take the form in which it now appears. It is a cleverly written pamphlet, consisting of about 90 octavo pages, and as the author is himself a mill-owner and a practical milller, his opinions are entitled to some consideration.

The employment of roller mills in the manufacture of flour is, he tells us, a subject of the deepest interest to every miller. Little heeded some years since, it has now become a cardinal question of the progress that is being made in milling industry. It is not merely a question of the employment of rollers for crushing grain with a view to preparing it for the further process of grinding with mill-stones; it is a question of employing them in the manufacture of flour *instead* of millstones, of performing every milling process with rollers only (not chilled iron, but porcelain), and arranging our mills accordingly. The author evidently expects that an immense impulse will be given to milling by his innovation, inasmuch as the "machinery will be less costly, the power required will be much smaller, the service simpler, the quantity of flour obtained larger and of infinitely better quality, and generally the task of milling will be executed with much greater completeness." A power capable of thus revolutionizing a whole industry is therefore a thing not to be despised; on the contrary, it behoves us to examine carefully the grounds on which opinions so confidently expressed are based.

Before we proceed to the consideration of the views enunciated by the author respecting the comparative merits of mill-stones and porcelain rollers for the manufacture of flour, it will be necessary to state what his opinions are in reference to the *summa ratio* of milling generally. This done, we shall show how, according to him, mill-stones have failed, and must necessarily fail, to accomplish the object for which they are intended; we shall point out his objection to chilled iron rollers; and, lastly, we shall show how, in his opinion, the defects of both these systems are to be remedied by the employment of porcelain rollers.

As regards its capacity for being separated, grain is very unequal and opposes an unequal resistance to the forces employed for reducing it. In general, the outer integument possesses greater firmness than the inward substance. It is difficult to separate it by tearing on account of its toughness, difficult to break it because it is more pliable, and to crush it because it is more extendable than the kernel, which in respect to these qualities only differs from it by its greater or less brittleness. It follows, therefore, that by employing the same force for reducing both, the inner substance is easier and sooner separated than the husk, the parts of the latter, and everything connected therewith capable of offering greater resistance, remain larger than the parts of the kernel, and may be separated accordingly. Herein lies the principle of all milling. With this separation of the pulverized grain according to the greater or less resistance of which it is capable, there is no corresponding separation as regards nutritive value. On the other hand, in the separation of the inner substance as *flour* from the rind in which it is enveloped, and from the adhering germ as *bran*, there is at the same time a separation of those parts in a direction which is decisive as regards requirements of food, in the way in which it affects the palate. This inner kernel and the flour obtained from it is more agreeable to the palate when unmixed with bran. The problem of milling, therefore, consists in producing flour perfectly free from bran, and, on account of its flavor, and the latter as fodder for the cattle employed in his service. This is the best use that can be made of any nourishment that may be contained in bran. In exchange for this our domestic animals render us valuable services; moreover, they provide us with meat, and a host of other things which are more savory and more digestible than the bran which, indigestible for us, but nourishing for them, we give them in exchange.

This, then, is the goal which we are reminded every miller should strive to attain: THE PRODUCTION OF BRANLESS FLOUR AND FLOURLESS BRAN.

The above, as the reader will perceive, fully coincides with the views expressed by Herr Pappenheim, in that section of his work wherein he treats of "The problem of the milling of the age."

The reduction of grain is the disconnecting of the several elements of which it is composed, and imparting to each a separate existence, which can only be done by the exercise of force with the view of overcoming the resistance offered by it. When this is sufficient the connection is destroyed. Pressure can do this, but if more pressure be employed than is necessary, the connection instead of being dissolved is more firmly cemented. Pressure, therefore, must have its limits. But the author tells us that something more than pressure is needed. Another force must be brought into operation, a force which draws the disconnected parts away from each other, a movement which he calls impulsion (Verschiebung). To these two forces a third must be added, which will carry the several portions of the grain forward, in order that one grain may give place to another grain in continued succession. In these three forces we have all the conditions requisite for grinding. Each of them has separate functions to perform, and in order that they may not come into collision, each movement must be entirely independent of the other. Pressure must do more than destroy the connection between the several parts; *impulsion* must do more than is necessary to the dispersion of the several disconnected parts, and the forwarding movement must perform its functions without exercising any influence on the principle of grinding generally. A collision of these several objects may take place when one of these movements cannot be regulated, and is, for instance, stronger than is necessary, regard being had to the nature of the grain, or when two objects are sought to be attained by one and the same movement.

From the co-operation and collision of movements, of pressing and gliding surfaces which are employed in grinding, the evil may arise which every miller should be careful to avoid—the generation of heat. He must guard against friction, because friction generates heat. Nevertheless, all friction does not do this. So long as the friction is not stronger, and the force employed is not greater than is necessary for the impulsion of the several parts, no heat will be generated. This happens when there is a superfluity of motion and force, and increases in proportion as the friction is uninterrupted. Friction arises from duration of contact, and increases in the same proportion as the pressure increases.

By paying attention to these physical laws we are enabled to regulate friction and avoid heat. Friction is interrupted by doing away with the contact. Two bodies are never in contact when a third is between them. This third body is, for the working surfaces, the flour material itself, for the interruption of the contact between this and the surface, the air.

We have now to examine what form these principles take in the means of grinding furnished respectively by mill-stones annd rollers.

"In the employment of mill-stones," the author tells us, "in the arrangement of the sets, there is no independent regulation of the forces necessary for the grinding of the grain, consequently the operation of the mill-stones is very irregular and unequal, and the liability to the effect of friction is very great." He attributes this to the circumstance that the revolution of the millstone supplies the same movement for more than one of the three forces above mentioned, and further, that the capacity of adhesion of the mill-stones (sharpness) does not last. Impulsion is exercised by a centrifugal motion which is unequal, and which, by increasing towards the periphery, tends to overstep the bounds of the force requisite therefor. In addition to this, since the capacity of adhesion engendered by the sharpness alters during the grinding, whilst the revolving speed remains the same, the flour-producing limits are continually being changed. They may and must end with periphery; nevertheless, with each degree of the increasing capacity of adhesion they endeavor to pass beyond it. The right thing to do would be to lessen the speed of the stones in the same proportion; but this is impossible, because the supply of material for grinding depends upon the same motion; it would cease to enter, and the supply would be cut off. The miller, therefore, strives to make up for the want of capacity of adhesion by increased pressure. But that has its limits; for pressure, although it may assist adhesion, cannot supply its place.

Mill-stones, we are told, are ill-adapted also for dealing tenderly with the husk, which along with everything else that offers more resistance than the floury kernel, they grind into bran. The preservation of the husk depends upon its not sticking and being held so fast as to get torn by the diverging motion of impulsion. The latter happens all the more ruthlessly in case it sticks; the quicker the motion, the more quickly and violently it must be torn away. If the capacity of adhesion of the stones were regular and the impulsion more uniform, there would be no difficulty in dealing gently with the husk, but in proportion as the motion of the surfaces of the mill-stones increased towards the periphery, the possibility of this happening is lost, and it gets torn.

That friction and consequent heat should arise from a superfluity of motion, and pressure, is not to be wondered at. Heat increases in proportion to the pressure. The pressure can, of course, be regulated by stopping, which is a costly operation; but what about the contact? The grain and its several parts are laid hold of and separated not once, but in continual succession; the contact, therefore, lasts a long time, and friction and heat find every encouragement. It is sought to interrupt the duration of the contact in millstones by the expedient of grooves, but the object is not attained. So long as it was a question of mere grinding, without regard to the separation of flour and bran, to the preservation of its nutritive properties, to capacity for baking and flavor, mill-stones were unquestionably the best means for grinding, and where nothing more is required, they are so still. They leave nothing to be desired in the way of simplicity of arrangement, they do a large quantity of work in a comparatively short space of time, facilitate a ready sale without making any large demands on the intelligence of the laborer; but from the moment that a demand sets in for better and more nutritious bread, the miller who grinds with mill-stones has a position to maintain which is difficult in proportion to the demand that is made upon him for finer, whiter, and purer flour.

To this effect is the indictment which the author in the work under consideration prefers against mill-stones, and against those evils, from which there is no escape, he sees no remedy except in their entire abandonment as implements for the manufacture of flour, and the general substitution of porcelain rollers in their stead; that is, if we attach any value to the possession of a fine, white, pure, and easily digestible article of food. We cannot do better than reproduce what he urges on this subject in his own words:

"If we would solve this problem by means of rollers, in their construction roller mills must posess the following qualities: The pressure which is to act upon the material to be ground must be capable of being regulated in proportion to its firmness, independent of every other consideration; there must be at the same time a regular movement of impulsion, equally independent of any other object, and this impulsion must be continually supported by an uniform capacity of adhesion in the surface of the roller. In order to be able to grind fine flour, the rollers must run so close to each other that nothing can pass between them without being ground.

"These conditions are fulfilled neither by roller mills with chilled iron rollers, nor yet by the earlier porcelain roller mills, but they are amply provided for by the newest construction of Wegmann's porcelain roller mills with differential speed.

"Every movement of this roller, which resembles the former one only in outward appearance, is executed by means of wheels. The wheels which drive the two rollers working together are of different sizes, so that the speed of the outer roller which, as is known, can be pressed by a lever, is less than that of the roller, which is fixed. The rollers themselves are made of porcelain, but are no longer smooth and polished, but ground.

"In consequence of these arrangements, the driving of the rollers is independent of the pressure. The latter is used only for operating upon the flour, and for this purpose, by tightening or relaxing the springs, it can be regulated at pleasure, even to stopping altogether. The unequal speed of the rollers, caused by the different sizes of the wheels, causes not an irregular, but a regular movement of impulsion on the surface of the rollers, the effect of which is likewise independent of pressure and of every other movement. But above all, the requisite capacity of adhesion of the surface of the rollers, for the impulsion, as also their close fit, is guaranteed by the qualities and the working of the porcelain which Wegmann uses.

"When we abandon the principle of absolute pressure in rollers—as is actually the case—when we admit the favorable operation of differential speed in the grinding of grain, and accept the principle of impulsion, it is impossible to ignore the preliminary condition of adhesion, and in this case we must have regard to the material of which rollers are made. It is no longer sufficient that it be hard enough, that it is capable of sustaining an immoderate pressure; it must possess the property of being able to hold; it must no longer be smooth and polished. The grain must be laid hold of and held firmly, in order that it may actually follow both directions presented by differential speed. Smooth, highly polished rollers with differential speed, act like smooth calendars; they glide over firmly pressed flour and stop up the pores.

"The quality of adhesion is possessed by no material in the same degree as porcelain, the most perfect of all ceramic products. Unpolished porcelain, the so-called biscuit, presents a dull, velvety surface, and in this state it is an incomparable material for milling with rollers. In this state it possesses the capacity of adhesion which enables it to act upon the smallest particles of flour, and to separate them. It presents a continual inheritent sharpness, which no art can give to any other material in equal fineness and regularity."

"It cannot be maintained," the author says, "that porcelain rollers do less work than chilled iron rollers. They have shown, wherever they have been rightly employed in the process of milling, that they are capable of doing *at least as much*. The question whether chilled iron rollers, in consequence of their tendency to oxidize, and especially on account of their continual exudation of carbon, do not color the flour *has not been decided* by a comparison with the flour ground by porcelain rollers, but as far as durability goes they are certainly inferior. It may be that the fixing of porcelain rollers on the iron axis has not hitherto been such as to be sufficiently depended upon. For this reason, as also because the bushes are liable to get heated, in consequence of which both the axis and the core stretch to such an extent that the porcelain roller breaks in two, there have been frequent and loud complaints. With the present advanced resources of mechanical science, it cannot be doubted that these defects will soon be overcome." And in a footnote he adds: "The coloring with cast-iron rollers and also with chilled iron rollers, may proceed from two causes. By oxidization the surface of the rollers may be covered with rust, or they may exude carbon. We know that cast-iron is never free from carbon; it exudes as graphite through the pores and gives a blue tinge to the flour. We are often deceived by this blue appearance in judging of the whiteness of flour. It is easily distinguished when tested by the so-called Pekar process, when we compare the flours with each other, wet. But the easiest method of convincing ourselves of this coloring is by wiping with a clean cloth rollers which have stood for some hours—it will be found to be *graphite gray*."

Herr Pappenheim, in his new work on milling, to which we have already referred, observes: "Whilst we are writing this, we are occupied with a new method of milling, which is destined to displace a great many things; at any rate it will do away with mill-stones for grinding corn." This observation refers, no doubt, to the porcelain roller mills, in favor of which the author expresses such enthusiastic admiration. Time alone will determine whether the expectations of the one or the vaticinations of the other are based on any sure and lasting foundation. We have lived long enough to see a great many illusions dispelled in our time, hopes frustrated, expectations disappointed, and prophecies falsified; but we have also seen changes at least as great as that now under consideration, which after having been pronounced impracticable by men eminent in science, have nevertheless become realities. In matters where great events are involved, modest diffidence may be excused, uncompromising negation in the case of objects, the realization of which presupposes no infringement of any of the laws of nature is unpardonable folly. We do now, as we have often done before, await the result. Meanwhile we take leave of the author, in the certain conviction that in case his most sanguine expectations are realized, though individuals may suffer, mankind will be benefited.

* Roller Milling: An essay on the manufacture of flour, and on the latest improvements in Milling, by H. Sellnick, Dr. Ph., with eight engravings on wood. Leipsic, Moritz Shaefer, 1878.

Situations Wanted, etc.

Millers, Engineers, Mechanics, etc., wanting situations, or mill-owners or manufacturers wanting employes, can have their cards inserted under this head for 50 cents per insertion, cash with order.

SITUATION WANTED—By a young man of experience as oiler in a flour mill or factory. Best of reference furnished. Address C. L. B., care of flour store, 1505 Franklin ave., Chicago. my*

SITUATION WANTED—I have had two years practical experience in a good flour mill, and want a situation where I can finish learning the trade. I can furnish first-class reference. Address
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WANTED—Situation as head or assistant miller in some first-class firm. Twenty years' experience in steam and water mills. Speak German and English. Salary an after consideration. Address
ap* LOUIS HALLER, Hicksville, O.

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WANTED—Millers out of employment and proprietors of mills to act as agents for the sale of the Ashland Patent Adjustable Sack Holder; one of the best selling articles out. Exclusive territory given. Sample sent to those who wish agency or to use on the receipt of $1.50. Address L. JEFF. SPRENGLE,
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SITUATION WANTED—By a young man, who has had four years' experience in the milling business. Being part owner of the Neely Mills, Columbia, Tenn., he has had the management of those mills, keeping the books, superintending the grinding, and doing some traveling for the mills. The firm of which he is a member have just leased out the mill and property for a term of years, and he wishes to engage with a medium-sized mill in any capacity. Can take charge of, and successfully run, a 2 or 3 run mill, attending to the stone dressing, grinding, and anything else necessary to do. Has had a good business education, and can furnish the best of references as to honesty, energy, and social standing. Address E. O. NEELY, Box 137,
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FOR SALE—A flouring mill, saw mill and 265 acres of land; 55 acres improved at a price to suit the times for one-half cash; balance long time. The water power is unsurpassed; two run of burrs with necessary machinery. Mill thoroughly repaired last season. Good wheat country. Situated at Orange, Juneau Co., Wis., on the M. & St. P. R. R. Address J. G. EVANS,
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FOR SALE—A grist mill with two run of stone, on one of the best and clearest water powers in the country. Two houses—one a hotel—barns, sheds, hog pen, ten lots with fine fruit trees, in the village of Bird, Oceana Co., Mich. The whole can be had for the give away price of $4,500, or one-half for $2,500. Being in other business the subscriber feels compelled to sell. Address at once,
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FOR SALE—A good custom and merchant mill, three stories high, built of stone, with three run of burrs; good water power, close to railroad. Also two dwelling houses and all necessary outer buildings, all covered with slate. The mill has all been rebuilt, with middlings purifier and all necessary machinery. The mill is now running day and night. Good grain country. This property is a splendid home and business, and will be sold very cheap. For particulars call on or address
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FOR SALE—A 2-run flour mill. Good burrs and bolts in perfect order and doing a good business. Water-power has 14 feet fall, fed by large lake. No ice or floods to contend with. The mill makes good flour and there is plenty of grain in the vicinity. The mill lot contains 4¾ acres in the town with two dwelling houses, large barn and shed. With the mill will be sold 80 acres of timber land one mile from town. Terms: $2,000 cash down, and balance in store goods or on five years time. Address for full particulars, WM. SKINNER,
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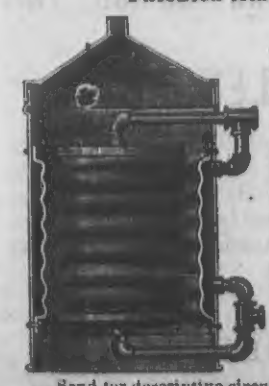

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WANTED—To buy or rent a mill, by a practical miller thoroughly versed in merchant and grist work. Talks both English and German, and can give best of references. Address, S. KAMERER,
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FOR SALE—A four-run steam flouring mill, all in first-class running order. Three 3¾ foot burrs for wheat and one 3¼ foot chopping burr, one Eureka wheat cleaner and a Eureka smutter, Garden City middlings purifier, Excelsior bran duster, Eureka flour packer and all other machinery necessary to complete a first-class mill. Two 28-flue boilers, 65-horse power engine. Stillwell heater. Frame building and seven desirable town lots belonging to the property. Side track of A., T. & S. railroad close by the mill, which is located in the city of Sterling, Rice Co., Kansas, in the midst of the best wheat district in the Arkansas valley. The parties owning the mill are not practical millers, and are engaged in other business. They will sell the property low and on easy terms. Address LANDIS & HOLLINGER,
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FILER, STOWELL & CO.,
mrtf Cream City Iron Works, Milwaukee, Wis.

FOR SALE—A Texas flour mill and land; a rare bargain. I offer my steam flouring mill at Trinity Mills, a depot 16 miles from Dallas, Texas, and on the Dallas & Witchita Railroad, for sale at a great sacrifice. The mill has three run of stone, two for wheat and one for corn. It has a capacity of 100 barrels per 24 hours; fine tubular boiler and good but old style engine; stones driven by beveled gear; mill built four years ago and cost over $9,000. With the mill I will sell 420 acres or more of land, on which near the mill are two dwellings of four rooms each and a large store-house; about 50 acres of superior prairie soil for field crops, fruit and vegetables; the balance is in timber and will afford perpetual fuel for the mill and fine pasturage. It is located on the Elm Fork of Trinity River, and is exceedingly fertile. I will sell the whole to a CASH purchaser for $15 per acre—not more than the value of the land. There is plenty of wheat raised in the county. Satisfactory reasons for selling. Address immediately,
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And I respectfully call your attention to it, and invite correspondence.

I have just sold rights for mills to the following well-known mill owners, to any of whom I refer you:

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Geo. Guettler, Thiensville, Wis.
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Orville Hathaway, Oconomowoc, Wis.
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Filer, Stowell & Co., Milwaukee, Wis.
Schauble & Vallansch, Fredonia, Wis.
Wm. Albrecht & Co., Newburg, Wis.
Wehausen & Co., Cedarburg, Wis.
Bodendoerfer & Zaun, Cedarburg, Wis.
Schroeder & Trottman, Cedarburg, Wis.
Chas. G. Deisner, Pewaukee, Wis.
M. Held, Jr., Sullivan Mills, Jefferson Co., Wis.
G. Schnekenbuhl, Palmyra, Wis.

I also refer to the following practical millers and millwrights: John Weber, Fredonia, Wis.; Ed. De Haas, Chas. Horn, Fred. Hall, H. R. Taylor, Geo. Richmond, Friedr. Mueller, Wm. Arnold, Geo. Bautz, Joseph Phillips, Geo. Henkel, L. Holz, Wm. Kuecker, E Hainke, Carl Gaudlitz, Fred. Kuecker, Henry Kuecker, Wm. Schmidt, Milwaukee, Wis.; John Lawson, John Flail, Grafton, Wis.; Jacob Schaefer, C. Schaefer, Milwaukee, Wis.; Wm. Simon, G. A. Clakowsky, Thiensville, Ozaukee Co., Wis.; H. Foote, J. Greene, Watertown, Wis.; Chas. Bachmann, Brandon, Wis.; B. Brendemuehl, John Dedrich, E. Hilgen, Fred. Kuhn, Cedarburg, Wis.

I have placed my price for RIGHTS for mills at an extremely low figure considering the value of my invention, so as to bring it within the reach of all. For further information and correspondence address

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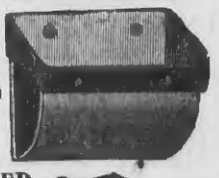

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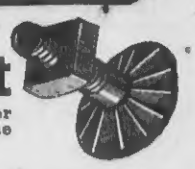

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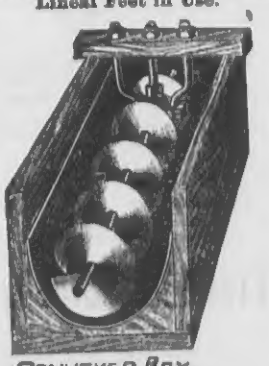
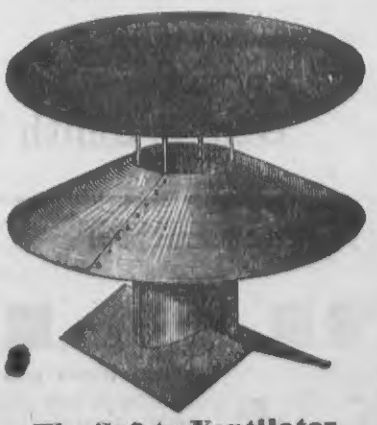
This is the Strongest, Most Durable and Efficient ever produced. 25,000 Lineal Feet in Use.



CONVEYER BOX
SHEET IRON LINING



The Safety Ventilator.

Rids the mill of dust by the natural draught.

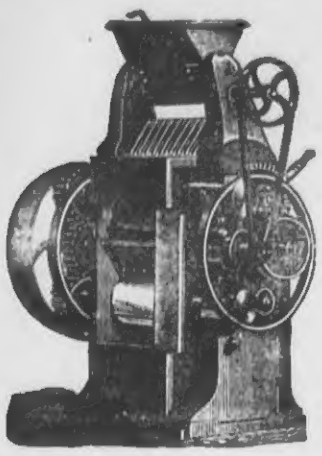
These goods of extraordinary merit and cheapness, together with all Mill and Warehouse Furnishings, sold by

N. HAWKINS & CO., Supply House,

224 Washington St., Chicago.

☞ Send for Lists and Prices of needed articles.

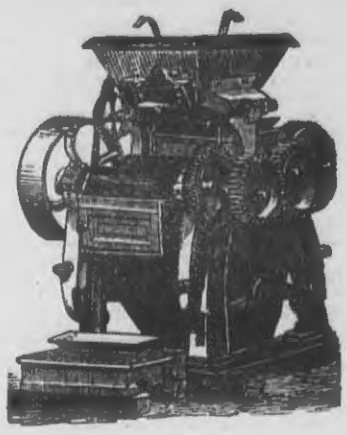
VIENNA EXHIBITION, 1873, Awarded Diploma of Honor. PARIS EXHIBITION, 1878, Awarded 2 Gold Medals and 1 Silver Medal.



GANZ & CO.'S

Iron Foundry and Manufacturing Association,

Buda-Pesth, Hungary, or Ratibor, Germany.



We take this method of recommending to the American milling public our PATENT ROLLER MILLS *with chilled cast iron rollers*, for crushing and grinding wheat, which have met with such eminent success in Europe. The mill-owners of BUDA-PESTH, as well as the prominent millers of Austro-Hungary, and a large number in Southern Germany, Switzerland and England, have provided for their mills the celebrated GANZ ROLLER MILLS, which are about to supplant entirely *grinding on mill-stones*, their working being more perfect, producing more white flour, requiring less power than the best mill-stone, and wanting no repairs excepting to occasionally replace a bearing. We have introduced into the art of milling these *Roller Mills with chilled cast iron rollers*, and from 1874 to January, 1879, we have delivered in the different European countries, Africa and the United States of America about 2,100 mills, and all work satisfactorily. Our crushing mills may now be regarded as absolulely necessary for every well-furnished modern mill, and this is proven by the numerous testimonials at hand. Our grinding mills are remarkable for their *absolute discharge bearings*, by means of the newly-devised *Anti-Friction Pressure Rings*. These Rings allow a very high pressure, and hence assure the performance of a great deal of work, avoiding all waste of power caused in other machines by friction in the bearings.

Out of numerous testimonials at hand we select the following:

BUDA-PESTH, March 28, 1878.—To Messrs. Ganz & Co., Foundry and Engineering Co., Limited, Buda-Pesth: Complying with your request to communicate to you my experience with your Roller material, I have pleasure in stating that I consider it, *i. e.*, your generally well-famed chilled iron, as the best within my experience, and its adoption *has satisfied me in every respect*, so that I do not hesitate to assert, by introducing it on a large scale, you have rendered *a considerable service to the milling art*. Your material is equally well adapted for *rough grinding, softening or grinding*. Owing to its great hardness I cannot characterise it otherwise than indestructible. The grooved cracking rollers have demonstrated this hardness, as also a toughness, of your castings in a manner which astonishes all who know the rapid wear of cutting edges used in the treatment of grain. Your smooth rollers, once properly ground, preserve their complete cylindrical form, and do not require any repair for a period which even now cannot be estimated. They acquire, soon after being put to work, a finely-gritted surface texture, eminently adapted for grinding as well as for drawing down the meal, a condition which they preserve without change. It is quite superfluous to prove that there can *be absolutely no question of discoloring* unless with reference to new rollers, to which some remnants of oil, emery or other matter may yet adhere. The flour produced by your Chilled-Iron Rollers *is very lively and has remarkable baking qualities*. While stating the above to the best of my conviction in answer to your inquiry, I seize with pleasure this opportunity to express to you my thorough approbation, *not* only of your roller material, but also generally of your roller mill construction. Your rough grinding (cracking) with chilled-iron roller mills constitutes such an essential step in advance as compared to the rough grinding with stones, that they cannot fail to win their way into every well-built mill, working on the high or half-high grinding system. For the purposes of reduction to flour you have lately erected a form of mill which I consider extraordinarily successful. You have by the introduction of an entirely new mechanical organ, *i. e.*, the *Rotary Anti-friction Spring Pressure Ring*, solved the problem of *discharged bearings*, which has so often been raised and as often dropped again unanswered. You have achieved success with decided aptitude in a manner as wondrous as it is simple and practical. This Roller Mill absorbs, in fact, only just the power required for the reduction into flour, and none for bearing friction, which usually, as is well known, amounts to a high figure. This Flour Mill receives an agreeable and light form while attaining a capacity hitherto unknown. In handing you the above communications for use as you may deem desirable, I remain, etc.,

(signed) C. HAGGENMACHER, Director of the First Ofen-Pesth Steam Mills.

TIVOLI KUNSTMUEHLE, Munich, April 5, 1878.—To Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: In reply to your esteemed of March 28, we have pleasure in testifying to our satisfaction with the Chilled-Iron Rollers supplied to us by you. We have now had both smooth and fluted Rollers in use for the last two years, and have not found any appreciable wear in the smooth Rollers. With reference to the work and capacity we can but report favorably. The Flour produced by them is lively, and not killed as has been stated in some quarters, while its baking properties are first rate. Referring to the lately supplied fluted Rollers, Mechwart's Patent, grooved on the new method, they work admirably and are especially to be recommended for mellow wheats. Recapitulating, your Roller material is as tough as it is hard, and therefore in every way adapted for the purpose it is intended. We remain,

Tivoli Kunstmuehle, A. MUELLER.

BUDA-PESTH, July 16, 1877.—Messrs. Ganz & Co., Buda-Pesth—Gentlemen: The most satisfactory results which, on testing the different Wheat-breaking Machines, we obtained from your Fluted Rollers, induced us to adopt your system and, in consequence, we already provided our mill with a great number of your Breaking-Rollers. In consideration of the experience derived from use of these Rollers we beg to point out as particular advantages of your *Wheat-breaking System* that *extremely little flour is produced*, provided the rollers are used as directed, that *your Rollers most satisfactorily detach the Semolina from the Bran, and thoroughly separate the Germ-Particles*, and finally that they are *of an astonishing durability*, and that it requires no skilled labor to manage them. Moreover it must be stated that your system suits perfectly well any process of Breaking-Wheat. It affords us so much more pleasure to give you the above account, as we are inclined to think that by the construction of these Rollers you have achieved an essential progress in the milling industry. Yours truly,

PESTER WALZMUEHL-GESELLSCHAFT. Riedle, m. p. Burchart, m. p.

BUDA-PESTH, July 11, 1878.—Messrs. Ganz & Co., Engineers, Buda-Pesth—Dear Sirs: Having had occasion to try your newly patented Roller mills *with others, known until now*, I feel induced, regarding their excellent qualities, to give orders for furnishing me the Roller mills to be erected in my two mills. These Roller mills are to be recommended by their construction, *surpassing all known* until now, and especially for their remarkable capacity, doing much work with little power. Believe us, gentlemen, Yours truly, HEINR. HAGGENMACHER.

BRANDEIS A. ADLER, Bohemia, February 13, 1879.—Messrs. Ganz & Co., Buda-Pesth—Gents: I give you my best thanks for your delivering to me your well-made and well-working machines, as well as for those 2 machines you delivered me last year. I have no objection to your publishing this. Yours faithfully,

G. HANNAK, Civil Engineer and Mill-owner.

Address all communications t

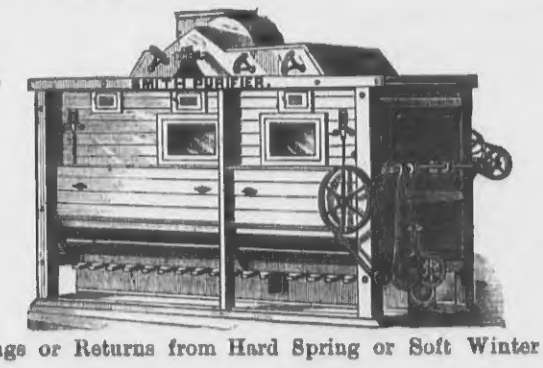
GANZ & CO., Buda-Pesth, Hungary,

Cable Address "GANZ, Kaiserbad." apr **Or GANZ & CO. Ratibor, Germany.**

The Geo. T. Smith
IMPROVED MIDDLINGS PURIFIER.

SIMPLE, DURABLE, ECONOMICAL,

AND REQUIRES BUT LITTLE POWER.



Purifies Middlings or Returns from Hard Spring or Soft Winter Wheat, thoroughly, and without waste.

HAS

The Traveling Brush, The Sectional Draft, The Pockets,

AND MANY OTHER IMPORTANT FEATURES.

A large number are in use in the successful New Process Mills of this country.

We manufacture eight sizes, adapted to the smallest or largest mills. Our prices range from $225 to $600, and cover a license under all of the patents owned by the Consolidated Middlings Purifier Company.

Send for our New Circular and price list with references.

Address the Manufacturers,

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aug JACKSON, MICHIGAN.

JOHN C. HIGGINS,

MANUFACTURER AND DRESSER OF

MILL PICKS

167 WEST KINZIE STREET, CHICAGO, ILL.

All work fully guaranteed. Responsible parties can have 30 to 60 days' trial on my new work, also on dressing where the Steel is of good quality, and has not been destroyed by working; and if not superior to any work produced in this country, there will be no charge for the same. A stronger warranty is unnecessary for any purpose.

ORDERS BY MAIL OR EXPRESS PROMPTLY ATTENDED TO.

Send for circular and reduced price-list. When shipping, always see that your proper address is either on the box or inside. feb

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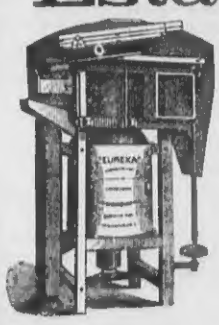
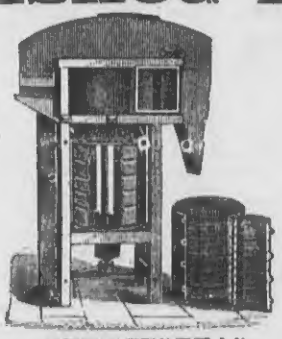
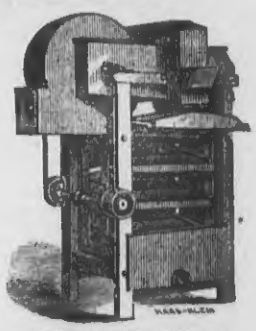
Established in 1856.



THE "EUREKA" Smut and Separating Machine.



THE "EUREKA" Brush Finishing Machine.



THE "EUREKA" SEPARATOR.

We continue, as heretofore, to manufacture in the best possible manner, the Wheat Cleaning Machinery here illustrated. On and after Jan. 1st, 1879, we will discount from our former prices of all our wheat-cleaning machinery 15 per cent, with an additional cash discount of 10 per cent if cash is paid in thirty days from date of shipment. We also keep full stocks of

Genuine Dufour and Dutch Anchor Bolting Cloths.

Send for Illustrated Pamphlet. Address

HOWES, BABCOCK & CO.,

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C. HARRISON & CO., 17 Fenchurch St., London,
Sole Agents for Great Britain and the Continent of Europe. apr

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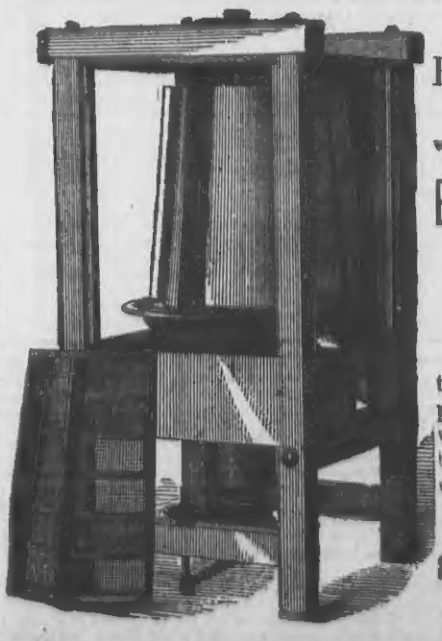
THE LATEST IMPROVED
HUCHES BRAN DUSTER.



Pat. Aug. 14, 1877.

PERFECTION ATTAINED AT LAST

Will ship to responsible parties on trial and warranted to give

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A CHALLENGE!

As all manufacturers of Bran Dusters claim their machines to be the best, we will agree to pay for any machine made in the world that will compete with ours, and be adjudged superior by competent judges, provided any other party will do the same with us.

Send for circular to

STEPHEN HUGHES & CO.,

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